**Questions and responses on AI 1.3 sharing studies**

**FSS studies**

**Doc 5A/553 (China)**

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| **ID** | **Topic** | **Question** | **Response from source of study** |
| GSOA #1 | P.452 %time | The study describes a Monte Carlo analysis. Why is a fixed 50% time used in P.452 propagation model? This value should be randomised at each step. Assuming 50% overestimates propagation loss.  | Technically, the Monte Carlo method is static simulation, it is not time-driven, so it cannot be directly matched with the time percentage. However, in order to reflect the time percentage in protection criteria of the interfered system, snapshots can be used to approximate the time slice, and then a certain probability value is taken on the I/N CDF curve to represent the time percentage in the protection criterion. The premise of this approach is that the number of snapshots is sufficient (to ensure that the simulation results can converge), and the values of each random variable in the simulation should avoid repeated screening by additional constraints.Based on the above description, in our simulation, the time percentage in protection criterion has been reflected by I/N CDF.The propagation loss is not independent from other variables (such as percentage of location, BS beam pointing), if the time percentage in protection criterion (e.g. 20%) used in the propagation model, and then get the percentage from the CDF (e.g. 80%) again, it means the time percentage considered twice, as a result, the final percentage is not the time percentage in protection criterion (e.g. 20%), it is the superposition of the 2 percentages, which will overestimate the interference.Therefore, we think it is relatively fair to select 50% time percentage for the propagation model, because 50% is a median, the final time percentage in protection criteria reflected by the value of CDF is reasonable. |
| GSOA #2 | Clutter | As per section 1.1.2.1 the study seems to consider application of clutter following P.2108 statistical model on both the FSS and MS side or on one side only. Can you please confirm? Could you please explain the rationale for applying such clutter consistently on both sides? ITU-R P.2108 statistical model was developed based on measurements at 6m heights and is applicable only when the stations are "well within the clutter". This assumption alone would add on average 60 dB attenuation.  | In this study, for urban macro scenario, the clutter loss is calculated on both MS side and FSS ES side. For suburban macro scenario, 2 cases are considered, i.e. apply clutter loss at both sides and apply clutter loss at MS side. It is a comprehensive consideration since there may be many higher buildings surround the MS BS and FSS ES in real world. |
| GSOA #3 | CDF curves | No intermediary nor final results are provided. Could these be added to this study? | Yes, of course, we will provide the CDF curves in the update document. |
| GSOA #4 | TDD and NLF | The study seems to account for the TDD and NLF of BS by reducing the amount of interference by these factors. Could you please confirm? If that is the case, since the interference is often driven by one dominant interferer, that methodology seems invalid. The method should consider the number of active BS at every time steps. For example in the study there are 19 BS = 57 sectors. At every time step, TDD\*NLF\*57 = 0.75\*0.5\*57 = 21 sectors are active. | In our study, we considered 57 sectors in one place, I think in such scenario these sectors are synchronous, (if consider large area simulation, maybe not this case), it means that 75% time, all BSs transmitting, 25% time all UE are transmitting, so it more relevant with average of time, so it is not 75% number of BSs are transmitting at one snapshot, maybe 75% BSs interference plus 25% UEs interference in is more appropriate. We only provided 75% BSs this time, we will consider to add 25% UEs interference in future meetings. The value of NLF are used to obtain the active BSs. |
| GSOA #5 | Polarisation | Was polarisation loss considered in this study? If so how much and what is the rationale for that polarisation loss?  | 3dB polarization loss is used for the aggregate interference study. The polarization of BSs and FS station side are not the same due to different locations and antenna point direction of BSs. Therefore 3dB average loss is considered. |
| GSOA #6 | MS station type | The study seems to consider only AAS antennas for the MS. The MS characteristics extracted from 5A/378 also contain non-AAS stations. All MS stations should be considered for the study of impact on FSS. Studies at previous study cycles considered IMT advanced non AAS. THis study cycle provided different non-AAS characteristics that should be considered. Why are MS BS 20m in urban and 25m in suburban, i.e. higher height in suburban than urban ?  | Currently, the study focuses on AAS stations, non-AAS is not considered yet, maybe we will do the simulation in our future study. The value of MS BS height are refer to the doc 5A/378 which is provided by WP5A. |
| GSOA #7 | Results | Why are the results for short term so close to the long term case? Perhaps this is because the percentage of time in the propagation model is fixed to 50%. | When considering the both sides clutter loss, the results for short-term are bigger than the long-term case. When considering only MS side clutter loss, the results for short-term are close to the long-term case. Therefore, it is related to the clutter loss rather than time percentage in the propagation model. |
| Russia #1 | Application of propagation model in P.452 | Since FSS protection criterion is specified for 20% and 0.005% of the time, application of 50% time percentage for P.452 overestimates propagation losses and does not allow to compare resulting I/N figures with FSS protection criterion (especially short-term criterion) and draw any conclusions on possibility of sharing with FSS. Additional studies with proper t% (20% and 0.005%) are required. | Technically, the Monte Carlo method is static simulation, it is not time-driven, so it cannot be directly matched with the time percentage. However, in order to reflect the time percentage in protection criteria of the interfered system, snapshots can be used to approximate the time slice, and then a certain probability value is taken on the I/N CDF curve to represent the time percentage in the protection criterion. The premise of this approach is that the number of snapshots is sufficient (to ensure that the simulation results can converge), and the values of each random variable in the simulation should avoid repeated screening by additional constraints.Based on the above description, in our simulation, the time percentage in protection criterion has been reflected by I/N CDF.The propagation loss is not independent from other variables (such as percentage of location, BS beam pointing), if the time percentage in protection criterion (e.g. 20%) used in the propagation model, and then get the percentage from the CDF (e.g. 80%) again, it means the time percentage considered twice, as a result, the final percentage is not the time percentage in protection criterion (e.g. 20%), it is the superposition of the 2 percentages, which will overestimate the interference.Therefore, we think it is relatively fair to select 50% time percentage for the propagation model, because 50% is a median, the final time percentage in protection criteria reflected by the value of CDF is reasonable. |
| Russia #2 | Application of Clutter loss | Section 1.1.1.3 states that the model defined in Recommendation ITU-R P.2108-1 is used in order to reasonably calculate the clutter loss. Section 1.1.2.1 states that urban and suburban macro scenario are considered in the simulation to calculate the interference from mobile service BSs to FSS earth station. For clutter loss model, the cases of both sides and only one side are considered in this study. Taking into account that MS BS antenna height is 20/25 m for Urban/Suburban macro deployments with below rooftop base station antenna deployment of 50/0% percent, the use of clutter model from section 3.2 of P.2108, applicable only for terminals well within clutter, needs to be justified. Corresponding percent of BS in Urban/Suburban macro deployments should be excluded from application of clutter loss for all of the snapshots. Alternatively, nominal clutter heights and distances from P.452 could be applied to calculate clutter loss. | Below-rooftop does not mean below the clutter and similarly above-rooftop does not indicate above the clutter. A BS can be located above rooftop but there can be higher buildings surrounding the building rooftop where the MS BS is deployed. Therefore clutter loss should be applied to all base stations. In urban/suburban scenario, there may be many surrounding buildings higher than 20/25m, considering different building height surrounding, clutter loss are different. The percentage of location is random in our study, it means that different clutter loss values have been considered including the low clutter loss cases. |
| Russia #3 | Application of TDD and NLF factor | It is not clear from the study, whether NLF was used. Clarification is required in the text of the study. Section 1.1.2.2 (formulae 2) indicates that the aggregate interference power density from all BS is calculated by scaling down interference from each BS by FTDD, which underestimates the level of interference into FSS. Taking into account that the total number of interfering BS (sectors) is low, interference into FSS is dominated by single/several BS, pointing twds FSS ES. FTDD should be used to limit the total number of active BS for each snapshot. | Yes, the NLF is used, we will add the text of NLF in the study. In our study, we considered 57 sectors in one place, I think in such scenario these sectors are synchronous, it means that 75% time, all BSs transmitting, 25% time all UE are transmitting, so it more relevant with average of time, so it is not 75% number of BSs are transmitting at each snapshot, maybe 75% BSs interference plus 25% UEs interference in is more appropriate. |
| Russia #4 | BS gain CDF | In order to compare results, BS antenna gain CDF towards horizon (elevation angle 0 degree) is essential (for single sector, pointing towards FSS ES). | We can provide the BS antenna gain CDF in the next meeting if time and resources are permitted. |
| Russia #5 | BS deployment | Is sector orientation for BS fixed in all snapshots? | The sector orientation of BS are fixed. |
| Russia #6 | MS stations with Non-AAS patterns | Probability of interference for MS stations with Non-AAS patterns would be higher, taking into account fixed geometry, however sharing studies for non-AAS MS stations are not provided, which does not allow to draw conclusion on possibility of sharing between MS and FSS. Additional studies are required. | Currently, the study focuses on AAS stations, non-AAS is not considered yet, maybe we will do the simulation in our future study. |

**Doc 5A/562 (Ericsson)**

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| **ID** | **Topic** | **Question** | **Response from source of study** |
| GSOA #1 | Elevation of the FSS ES and FSS height  | Why is the minimum elevation set to 26 degrees by limiting the satellite longitudinal position to +-50 degrees? In addition this is for one specific position on the earth and this would vary from one FSS ES position to another. Is an FSS height of 5m in urban scenario realistic ? | We revised several active GSO satellites providing service to the African continent and more specifically to Cairo area. We found out that most of the satellites where within a +/- 50 deg offset from the FSS ESS, e.g., SES-5, NSS-7, Yahsat 1A.Also, we believe that 5m is reasonable mean value for FSS ESs provided that FSS ES with small antennas are generally deployed on the roofs of buildings or on the ground in urban and suburban scenarios. |
| GSOA #2 | Clutter | Study seems to consider application of clutter following P.2108 statistical model on both the FS and MS side or on one side only. Can you please confirm? Could you please explain the rationale for applying such clutter consistently on both sides? ITU-R P.2108 statistical model was developed based on measurements at 6m heights and is applicable only when the stations are "well within the clutter".  | For the sake of completeness, we believe that clutter loss on the FSS should be considered, for example:* As depicted in contribution 5D/999 from Russian administration, in many cases this is more than possible, for instance, Globalstar gateway located in the Russian town Pavlovsky Posad is located around the urban/suburban clutter as well as around the trees, and taking into account low antenna height, random clutter may be applied to the ES side.

* It’s important to consider results where clutter loss is applied on the FSS side, thus, argumentation can be provided to justify implementing additional mitigation scheme, e.g., shielding.
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| GSOA #3 | P.2001 %time | Can you please confirm that at every iteration the percentage of time is randomised ? | Correct |
| GSOA #4 | Protection criteria | We see that only the long term protection criteria is considered. Why wasn't the short term protection criteria considered when a similar input at 5D considered this protection criteria? | As mentioned during the meeting, short-term criterion results will be provided in an future update of this study. |
| GSOA #5 | CDF curves | From the previous contribution 5D/1125 that considered a fixed time percentage for the propagation model. When comparing the CDF curves of 5D/1125 with 5A/562, for which I believe the main difference is the randomisation of the time percentage in the propagation model, the curves look very similar and the range between min and max I/N in the CDF seem very similar. One would expect more change for low time percentages. Could you please provide clarification on this? UE impact change quite a bit between the two contributions but not BS impact. | In comparison with our study 5D/1125, we have changed more parameters not only the P.2001 time percentage, e.g., FSS ES antenna height, FSS ES elevation angle range. Thus, a direct comparison is not possible.However, although the I/N values for low percentages didn’t change much, for other values it did as expected, e.g., at 1% there is a difference of around 4 dB. |
| GSOA #6 | MS station type | The study seems to consider only AAS antennas for the MS. The MS characteristics extracted from 5A/378 also contain non-AAS stations. All MS stations should be considered for the study of impact on FSS. Studies at previous study cycles considered IMT advanced non AAS. THis study cycle provided different non-AAS characteristics that should be considered. Also only urban deployment is considered in this study. | As mentioned during the meeting, we focus or study on AAS systems since non-AAS were studied in previous cycles even if with somewhat different parameters. |
| GSOA #7 | Polarisation | Where is the rationale or reference for the 3dB polarisation attenuation? | The following 2 references indicate that a polarization loss of 3 dB should be used for aggregate interference case (57 BSs & 3 UEs/Bs):- ECC Report 302 - Section 5.5 [link]- Annex 1 to the Task Group 5/1 Chairman’s Report towards WRC-19We have discussed this previously in 5D and we have stated that the polarization loss (PL) between MS BSs and a receiver can be approximated as cos2θ, where θ is the angle between the receiver FSS ES and MS BS polarizations. The signals’ polarization from different BSs/UEs at the FSS ES are not the same (e.g., change of polarization due to reflections, etc), thus the PL mean converges to 0.5 (3 dB) for aggregate interference studies [ECC Report 302].In addition, in Rec. ITU-R F.1245, Note 7 exemplifies coupling from space stations not MS BSs where the latter typically have a considerably larger 3 dB beamwidth and sidelobes, thus polarization loss should be expected for the whole pattern which is line with the clarifications made in the Annex 1 to the Task Group 5/1 Chairman’s Report. |
| GSOA #8 | Correction factor of S.465 | 3dB was considered as a "correction factor" of the S.465 and it is characterised as conservative. That recommendation provide a mask gain envelope based on multitude of antenna measurement. The aim is to provide the ITU with a mask that can be used to provide sufficient protection guaranties to the antenna considered but it works both ways as for interference analysis of antennas this mask would also be considered. This recommendation was established in 1993 and revised in 2010 and no correction factors are suggested or were applied during previous cycle studies. The input says "the actual gain of the sidelobes is below the values in Recommendation ITU-R S.465-6": this is certainly not true for the high elevation angles considered in the study. For the elevation angles considered, there is a good match with the antenna pattern. Far off-axis angles are not considered in the study. There is no justification for such 3dB adjutment in this contribution. | 3dB was considered as a "correction factor" of the S.465 and it is characterised as conservative. That recommendation provide a mask gain envelope based on multitude of antenna measurement. The aim is to provide the ITU with a mask that can be used to provide sufficient protection guaranties to the antenna considered but it works both ways as for interference analysis of antennas this mask would also be considered. This recommendation was established in 1993 and revised in 2010 and no correction factors are suggested or were applied during previous cycle studies. The input says "the actual gain of the sidelobes is below the values in Recommendation ITU-R S.465-6": this is certainly not true for the high elevation angles considered in the study. For the elevation angles considered, there is a good match with the antenna pattern. Far off-axis angles are not considered in the study. There is no justification for such 3dB adjutment in this contribution.R:/ We are still working on a proper method to determine a more accurate scaling factor. As we have expressed before, we believe that the mask provided un Rec. S.465 overestimates the sidelobe gain of FSS ESs. For example, in ECC Report 272 (p.31) real measurements of parabolic antenna patterns are provided:cid:image002.jpg@01D870B3.077D51E0Although not the same frequency and mask as in our studies, the concept is similar. |
| Russia #1 | Application of Clutter loss | Statistical clutter loss model defined in Recommendation ITU-R P.2108-1 is applied for all MS BS within Urban macro deployment as well as for FSS ES. Taking into account that MS BS antenna height is 20 m for Urban macro deployments with below rooftop base station antenna deployment of 50% percent, the use of clutter model from section 3.2 of P.2108, applicable only for terminals well within clutter, needs additional justification. Low probability of LOS for Urban Macro deployments could not be taken as an argument since clutter loss is dependent on the distance to the closest shielding object along the pass. Therefore, corresponding percent of BS in Urban macro deployments should be excluded from application of clutter loss for all of the snapshots. Alternatively, nominal clutter heights and distances from P.452 could be applied to calculate clutter loss. | Although the terrestrial path clutter loss model in Rec. ITU-R P.2108-1 §3.2 was developed based on measurements using terminal heights up to 6 m over ground, there is evidence that the clutter loss is significant also for typical IMT base station heights, which is a consequence of a predominance of NLOS conditions due to the non-uniformity of clutter and terrain heights. Please refer to the contribution 3M/340 for more information. |
| Russia #2 | Application of propagation model in P.2001 | Section X.2.1 states that uniform distribution of time percentage (0-100%) is used as a parameter for P.2001 Since long-term FSS protection criterion is specified for 20% of the time, the application of uniform distribution of time percentage (0-100%) for P.2001 overestimates propagation losses and does not allow to compare resulting I/N figures with FSS protection criterion and draw any conclusions on possibility of sharing with FSS. Additional studies with proper t% (20% and 0.005%) are required. | In section 5.3 of Rec. P.2001 is stated that for Monte Carlo simulations the whole range 0-100% (random variable) should be consider for the time percentage, thus we are following the recommends in Rec. P.2001. |
| Russia #3 | Application of TDD and NLF factor | It is not clear from the study, whether NLF was used and how exactly TDD factor was used. Clarification is required in the text of the study. | Indeed we consider both the NLF and TDD factors. In an update od our study will amend the content to clarify this aspect. |
| Russia #4 | BS gain CDF | Figure 6 provides BS antenna gain CDF towards FS ESS. Clarification on orientation of BS sector and elevation angle twds FSS ES is required. | In Figure 2 is shown the IMT cluster deployment and sectors. We see that the IMT cluster in the Figure is a bit small. Next, you can see a better Figure with a small separation distance:cid:image001.png@01D8715E.91CCEB20 |
| Russia #5 | Polarization loss | Section X.1.1 indicates that polarization loss of 3 dB was used for the studies. Taking into account that the total number of interfering BS (sectors) is low, interference into FSS ES is dominated by single/several BS, pointing twds FSS ES. For the case of main-beam to side-lobe interference 3 dB polarization loss does not seem appropriate (see section 9 to Annex 1 to Document 5-1/478-E) | Please check our reply to GSOA’s question 7. In addition:- In section 9 to Annex 1 to Document 5-1/478-E, a polarization loss of 0 dB is only contemplated for single-entry studies. In our study we consider aggregate interference.- For the active MS BSs per snapshot (i.e., 57\*NFL\_factor\*TDD\_factor ~22), next can be seen the histogram for 1 million snapshots of the mean polarization loss per snapshot as indicated in ECC Report 302 - Section 5.5 [link] assuming a random polarization angle between each BS and the FSS ES:cid:image003.png@01D8715E.91DC7B80It can be seen that the mean polarization loss is 0.5 (3 dB). |
| Russia #6 | MS stations with Non-AAS patterns | Probability of interference for MS stations with Non-AAS patterns would be higher, taking into account fixed geometry, however sharing studies for non-AAS MS stations are not provided, which does not allow to draw conclusion on possibility of sharing between MS and FSS. Additional studies are required. | Please check our reply to GSOA’s question 6. |
| Russia #7 | The use of FSS ES elevation angle distribution in Monte-Carlo simulations | The rationale to limit the minimum elevation angle of the FSS ES to 26 degrees is not justified, deployment of existing and future FSS stations could not be limited to the cases when the elevation angle exceeds 26 degrees. This is undue constraint for FSS. The number of snapshots needs to be specified in the text of the study. In order to protect specific FSS ES assessment of the minimum separation distance to MS deployment should be made with fixed value of the FSS ES elevation angle. The resulting CDF is mixing time statistics with geographical location of the FSS ES stations (taking into account that each snapshot uses random elevation angle value) and does not allow to compare resulting I/N figures with FSS protection criterion and draw any conclusions on possibility of sharing with FSS. This CDF figure states that for [Number of snapshots] FSS ES with elevation angle from 26 to 55 degrees aggregate I/N from MS deployment located [X] km away at one specific moment in time does not exceed -10.5 dB. | In our contribution we have provided worst-case results where the FSS ES elevation angle is fixed and equal to 26 degrees. Also, please check our reply to GSOA’s question 1. |
| Russia #8 | The use of additional 3 dB margin | Section X.1.2 contains assumptions for FSS ES technical characteristics 1) the actual gain of the sidelobes is below the values in Recommendation ITU-R S.465-6, 2) antenna noise temperature is dependent on the antenna elevation angle. Those assumptions are used to advocate for an additional ~3 dB margin in the study. Recommendation S.465 provides an envelope for the antenna gain pattern, which still could be exceeded by a small percentage of the side-lobe peaks. For the elevation angles under consideration in the study S.465 provides a good fit. System noise temperature figures, provided by WP 4A, include antenna noise temperature for the case of minimum operational elevation angle. Therefore, the use of 3 dB margin is not justified | Please check our reply to GSOA’s question 8. |

**Doc 5A/564 (Nigeria, South Africa, Zimbabwe)**

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| **ID** | **Topic** | **Question** | **Response from source of study** |
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**Doc 5A/566 (GSMA)**

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| **ID** | **Topic** | **Question** | **Response from source of study** |
| GSOA #1 | FSS elevation and height  | Study FSS ES at elevations of 30 and 68 degrees. Why was this considered? Sharing study should consider all FSS deployment including lower elevations. Given that Harare is 31E longitude and that the input indicates for case ii) a GSO position 50deg east, this would a GSO position at about 80 deg east: how is possible to result in 30 deg elevation for the FSS ES ? Is an FSS height of 1.8m in urban scenario realistic ? | The earth station antenna elevation angles set out in Table 4 of the GSMA input document are correct for both GSO satellite positions: i) where the earth station and the GSO satellite are co-longitude and ii) where the GSO satellite is offset in longitude by 50 degrees. We have considered practical geometries in this study including calculated earth station antenna elevation angles rather than arbitrarily low and unrealistic elevation angles. Re FSS ES height, we assumed antenna diameter = 3 m in this case study, and used rule of thumb calculation that h = D/2 + 0.2\*(D/2), which gives h = 1.8 m for a 3 m dish antenna. While the MS cluster is assumed to be in an urban area, the distant FSS earth station may not be in an urban environment. |
| GSOA #2 | Conclusions | It is unclear what the conclusion is and how the percentage of time presented in the table of results are comparable to the percentage of time from the protection criteria. Could you please clarify? | The results in Table 4 give probabilities that ΣI/N = -10 dB is exceeded for each of the scenarios considered in this study, and Figures 4 to 7 provide CCDFs for these scenarios. These probabilities are not directly comparable with percentages in FSS protection criteria, since the probabilities calculated in this study are not in the time domain, however they show that the probabilities of interference are very low. |
| GSOA #3 | Clutter | P.2108 clutter is considered only on the IMT BS. Is this correct? Why is it applied for BS that are above rooftops? Noting that the urban BS is at 20m height and 50% are above rooftop, should the clutter only be applied to 50% of the stations. The P.2108 model was derived from measurements at 6m height and is only applicable to stations "well within the clutter". | Statistical clutter loss has been applied at one end of the interfering signal paths (the MS base station end, with no clutter loss applied at the FSS ES end). As explained in other input studies to this WP 5A meeting, the line-of-sight probability in urban areas will be very low (even for base stations above rooftop). Furthermore, it would also be realistic to apply clutter loss at the FSS ES end of the path in at least some cases. |
| GSOA #4 | MS station type | The study seems to consider only AAS antennas for the MS. The MS characteristics extracted from 5A/378 also contain non-AAS stations. All MS stations should be considered for the study of impact on FSS. Studies at previous study cycles considered IMT advanced non AAS. THis study cycle provided different non-AAS characteristics that should be considered. Also only urban deployment is considered in this study. | Non-AAS systems were extensively studied in previous ITU-R study cycles, therefore we have focused on AAS systems in this study. |
| GSOA #5 | Network loading | What is the rationale for a network loading of 20%? For such cases, 50% is the value to be used. | A network loading of 20% represents a typical value for the loading of base stations across a mobile network (or part thereof) to be used in sharing studies that are considering a relatively wide area such as that in this study. However, we have also performed calculations for 50% network loading for sensitivity analysis. |
| GSOA #6 | Polarisation | Where is the rationale or reference for the 3dB polarisation attenuation? | 3 dB polarisation loss is the appropriate value to be used for studies of aggregate interference from mobile networks such as in this study. This was extensively discussed in TG 5/1 during the last study cycle (see Doc 5-1/478, Annex 1). |
| Russia #1 | Application of Clutter loss | Statistical clutter loss model defined in Recommendation ITU-R P.2108-1 is applied for all MS BS within Urban macro deployment. Taking into account that MS BS antenna height is 20 m for Urban macro deployments with below rooftop base station antenna deployment of 50% percent, the use of clutter model from section 3.2 of P.2108, applicable only for terminals well within clutter, needs additional justification.. Therefore, corresponding percent of BS in Urban macro deployments should be excluded from application of clutter loss for all of the snapshots. Alternatively, nominal clutter heights and distances from P.452 could be applied to calculate clutter loss. | In our study, statistical clutter loss has been applied at only one end of the interfering signal paths (the MS base station end, with no clutter loss applied at the FSS ES end). As explained in other inputs to this meeting, the line-of-sight probability in urban areas will be very low (even for base stations above rooftop). Furthermore, it would also be realistic to apply clutter loss at the FSS ES end of the path in some cases. |
| Russia #2 | Application of propagation model in P.452 | Section A.3 states that a distribution of time percentage (0-50%) is used as a parameter for P.452. Since FSS protection criterion is specified for 20% and 0.005% of the time, application of random value within 0-50% time percentage for P.452 would overestimate propagation losses and would not allow to compare resulting I/N figures with FSS protection criterion (especially short-term criterion) and draw any conclusions on possibility of sharing with FSS. Additional studies with proper t% (20% and 0.005%) are required. | We believe that random selection of percentages used in P.452 propagation model is appropriate method to use in Monte-Carlo simulations such as those in this study. |
| Russia #3 | Application of TDD and NLF factor | It is not clear from the study, how NLF and TDD factors were used. Clarification is required in the text of the study. | Network loading and TDD factors were applied according to Recommendation ITU-R M.2101. |
| Russia #4 | BS gain CDF | In order to compare results, BS antenna gain CDF towards horizon (elevation angle 0 degree) is essential (for single sector, pointing towards FS station). | Gain is generated internally within Visualyse for each iteration within the simulation. |
| Russia #5 | Polarization loss | Section A.4 indicates that polarization loss of 3 dB was used for the studies. Taking into account that the total number of interfering BS (sectors) is low, interference into FSS ES is dominated by single/several BS, pointing twds FSS ES. For the case of main-beam to side-lobe interference 3 dB polarization loss does not seem appropriate (see section 9 to Annex 1 to Document 5-1/478-E) | We disagree with this, and believe that 3 dB polarization loss is the appropriate value to be used for studies of aggregate interference from mobile networks such as in this study, and that this is in line with Doc 5-1/478, Annex 1. |
| Russia #6 | MS stations with Non-AAS patterns | Probability of interference for MS stations with Non-AAS patterns would be higher, taking into account fixed geometry, however sharing studies for non-AAS MS stations are not provided, which does not allow to draw conclusion on possibility of sharing between MS and FSS. Additional studies are required. | Non-AAS systems were extensively studied in previous ITU-R study cycles, therefore we have focused on AAS systems in this study. |
| Russia #7 | FSS ES elevation angle | This case study assumes that the minimum elevation angle of the FSS ES is 30 degrees, deployment of existing and future FSS stations could not be limited to the cases when the elevation angle exceeds 30 degrees. This is undue constraint for FSS. In order to protect specific FSS ES assessment of the minimum separation distance to MS deployment should be made with fixed value of the FSS ES elevation angle. (In order to protect FSS ES MS deployment needs to be shifted away, not the other way around). | In this case study, we have used FSS earth station antenna elevation angles that are realistic / representative of those used at the location in Southern Africa that has been used in this case study, rather than arbitrarily low and unrealistic elevation angles. |
| Russia #8 | Interpretation of the I/N CDF | The resulting CDF is mixing time, probability and location statistics and does not allow to compare resulting I/N figures with FSS protection criterion (especially short-term interference criterion) and draw any conclusions on possibility of sharing with FSS. The Resulting CDF figure states that for [Number of snapshots] FSS ES with elevation angle from 26 to 55 degrees aggregate I/N from MS deployment located [X] km away at one specific moment in time does not exceed -10.5 dB. | We agree that the probabilities calculated in this study are not directly comparable with percentages in FSS protection criteria, since the probabilities calculated are not in the time domain. However, it is clear that the results of this study indicate that probabilities of interference are very low. |

**Doc 5A/574 (Nokia)**

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| **ID** | **Topic** | **Question** | **Response from source of study** |
| GSOA #1 | FSS height  | Is an FSS height of 5m in urban scenario realistic ? | The question is not relevant to our study, since the study didn’t assume that the FSS was in any specific environment. The FSS height of 5m though is a realistic assumption. |
| GSOA #2 | Clutter | P.2108 statistical model is applied all the time on the FSS ES side. The explanation given was because the FSS height considered was 5m and therefore the proponents believes that would justify clutter being applicable all the time. Where is this assumption coming from? What if the FSS ES has a higher height, what then? Noting that the clutter model provides on average 30dB the results just based on that assumption would completely change the results.Note that in one case clutter is considered for urban BS to only stations below rooftop. Are MS BS at 20m in urban and 25m in suburban consistent with the scenario which assumes ALL of the MS BS are well within clutter ? Why was the case of applying clutter all the time to BS in urban taken into account? Was it as a sensitivity analysis? | The application of clutter is in accordance to ITU-R P.2108. The study hasn’t considered other FSS ES antenna heights.The study considered 3 typical cases:clutter applied to 50% of urban BS. clutter applied to 100% of urban BS.clutter applied to 0% of suburban BS. |
| GSOA #3 | Polarisation | Where is the rationale or reference for the 3dB polarisation attenuation? | We applied 3dB polarisation loss due to aggregate interference. This topic has been discussed in TG5/1. |
| GSOA #4 | Protection criteria | We see that only the long term protection criteria is considered. Why wasn't the short term protection criteria considered when one was provided by WP4A (I/N=-1.3dB for not more than 0.005% time)? Although it notes that this might vary, this value is still provided and should be considered for studies. | We didn’t consider the short-term criterion since Note 4 of WP4A states that “WP 4A has not completed its work in developing short-term protection criteria”. |
| GSOA #5 | MS station type | The study seems to consider only AAS antennas for the MS. The MS characteristics extracted from 5A/378 also contain non-AAS stations. All MS stations should be considered for the study of impact on FSS. Studies at previous study cycles considered IMT advanced non AAS. THis study cycle provided different non-AAS characteristics that should be considered. Why are MS BS 20m in urban and 25m in suburban, i.e. higher height in suburban than urban ?  | The study considered the antenna heights of MS BS in urban and suburban environments as provided in 5A/378. |
| GSOA #6 | P.2001 %time | Can you please confirm that at every iteration the percentage of time is randomised ? Also it is noted in the advice from WP 3K and 3M in 5A.384 was for interference analysis, Recommendation P.2001 should be used by choosing small values for time percentage (Tpc). We would like to seek clarification on propagation loss for 20% for long term interference would fall within the remit of this recommendation | ConfirmedAs of the guidance given from WPs 3K and 3M, Recommendation ITU-R P.2001 “provides a calculation for basic transmission loss across the full distribution of time percentages”. |
| GSOA #7 | CDF curves | Difference of a few km (lower) in this contribution compared to same study in 5D under 1.2 (5D/1145). Is it because of the randomisation of percentage of time? If so why 4km less? How can it be explained?  | This study is not the same as the one in 5D/1145 and the parameters and assumptions are listed in the relevant documents. |
| Russia #1 | Application of propagation model in P.2001 | Section 1.1.1.3 states that random time percentage is used as a parameter for P.2001. What is the range for t%, 0-100%? | Yes |

**Doc 5A/584 (Burkina Faso et al)**

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| **ID** | **Topic** | **Question** | **Response from source of study** |
| GSMA #1 | Presentation of separation distances (Study A) | In results in section 1.2.2.2 in Study A, the circles that are drawn in the figures and separation distances that are given in the tables appear to represent the largest / worst case distances that are calculated for each location. Can you confirm this is the case? | The separation distances indicated are the envelope of all separation distances. The largest separation is therefore presented. |
| GSMA #2 | FSS ES antenna pointing (Study A) | Please can you clarify what is the assumption regarding FSS ES antenna pointing for each study (both single entry and aggregate)? For example, for single entry study on pages 11-18, when the earth station is located to the south of the IMT network, is the ES antenna assumed to be pointing northwards towards the IMT network, or southwards towards the GSO satellite and away from the IMT network as would be the case in reality? | For the analyses in study A, specific FSS ES pointing is taken into account. Each considered earth station is based on an existing coordinated ES in the countries under study and is pointing towards a specific satellite at an orbital location. The elevation and azimuth of the FSS ES antenna is therefore dependent on the orbital position of the satellite that the ES is pointing to. |
| GSMA #3 | FSS elevation angle (Study B) | The study appears to be assuming a fixed elevation angle of 10 degrees. In what situation is this elevation angle realistic for countries in West Africa? | The elevation of an ES depends entirely at which orbital position it is pointing to. Any station could point at elevations of 10 degrees if pointing to specific parts of the visible GSO arc. As an example the operating FSS ES in Study A in Niamey pointing at IS-17 (66E) has an elevation of 17 degrees. Satellite capabilities is not unlimited and therefore some stations need to point at lower elevations to connect to satellite with available capabilities. In addition this study is a generic study and by considering 10 degrees we cover cases of FSS ES elevation above 10 degrees. |
| GSMA #4 | FSS protection criteria (Study B) | The adjacent band study in section 1.2.3 of Study B appears to be using an FSS protection criterion of I/N = -20 dB (for 20% time). We believe that such a stringent protection criterion is highly excessive and unnecessary, and that an adjacent band criterion of I/N = -10 dB (or -10.5 dB) for 20% time is sufficient. This will have very little impact on the overall interference margin available at the FSS receiver (see Doc 4A/650), but will have a big impact on the ability to use spectrum efficiently. | We had these discussions at WP4A and there was no agreement from WP4A. We do not agree with taking the same protection in-band criteria for the adjacent band case. The rationale and context is explained in detail in section 1.2.1.2 of study B. The value comes from Rec S.1432 which is the applicable Recommendation. We note that in the question there is no justification whatsoever for considering the in-band criteria as applicable for the adjacent band situation. |
| GSMA #5 | LNA/LNB blocking performance of FSS receivers (Study B) | The LNA/LNB blocking threshold of FSS ES receivers assumed in the adjacent band study appears to be very low. We would expect that most FSS ES receivers should be able to perform better than this, or if not then they should be better engineered in order to do so. | This level of blocking of -59dBm is standard for LNA/LNB and is already quite high as the LNA/LNB will already experience non-linear behavior at -68dBm. This reference level of blocking of -59dBm is 1 dB less stringent than the value provided by WP4A (see LS 5A |
| Ericsson #1 | Clutter | Can you provide evidence of the direct linkage between the clutter loss application and the percentage of MS BSs below rooftop? Note: Although the terrestrial path clutter loss model in Rec. ITU-R P.2108-1 §3.2 was developed based on measurements using terminal heights up to 6 m over ground, there is evidence that the clutter loss is significant also for typical IMT base station heights, which is a consequence of a predominance of NLOS conditions due to the non-uniformity of clutter and terrain heights. Please refer to the contribution 3M/340 for more information. | Following the discussion in the elaboration of these below rooftop parameters at WP5D, it was established exactly for the purpose of determining clutter implementation.Thank you for this study conducted in 3 specific cities in Australia,UK that you have just submitted recently to WP3M. We however at this stage were provided with a recommendation P.2108 that derived its clutter loss model on antenna heights of 6m and is applicable to "antennas well within clutter". Based on the current recommendation and the fact that these studies are aimed at determining the potential impact of MS into FSS stations, we do not understand how such a model adding 30dB attenuation on average should be considered consistently for stations at 20-25m heights and for FSS ES that could be in uncluttered environments. |
| Ericsson #2 | CDF curves | Study B (in-band) seems to be the same study as GSOA study 5D/1134. During the 5D meeting, it was noted that intermediate results were needed since the gap between 5D/1134 and all other studies was substantial. In addition, we tried to replicate one of the cases in this study and found out a difference of ~7.5 dB and ~21 dB for long- and short-term results respectively:cid:image001.png@01D870B3.077D51E0Could you add intermediate results to this study and provide some comments on where do you think the difference is coming from? | Thank you for trying to replicate the results. We can provide additional intermediate results where necessary to further clarify our study. For the short term analysis we believe the differences come from the implementation of the randomisation of the time percentage in the propagation model. We have similarly noted that in your short term results, your CDF curve results seem to vary from our own.To determine exactly what would lead to these differences a more in depth review of each analysis assumption would be needed. |
| Ericsson #3 | Polarisation | Provided our answer to question 7 below, can you provide your rationale for not applying polarization loss at all? | See our response to question 3 of China. In addition your reference of Report 302 section 5.5 seems to relate to FSS uplink into a satellite receiver which would see a great deal more sources of interference than 19 BS. The section also mentions quite clearly that WAS RLAN have no fixed orientation whereas in this case the MS BS have gains >20dBi, therefore polarisation may be present in the main beam but degrade in side lobes. |
| Ericsson #4 | Blocking | In Study B (adjacent-band):1. For Case 1, was a passband filter considered and why?2. To get the “Max. I at the LNB vs. Distance results” in section 1.2.3.1.2 (Results of adjacent case 1), was the network loading factor included? | 1. No passband filter was considered. The reason is that most ES today do not have these filters implemented. The aim of the study is to show the amount that would need to be attenuated for the ES to continue operating. Filter of course means added cost, impacts the FSS receiver performances and requires frequency separation to be effective.2. Yes network load factor along with TDD factor are considered for this case too. |
| Nokia #1 | Antenna type selection and single entry results(Study A) | For the co-channel studies (study A), only non-AAS antennas were assumed for the single entry interference. What was the reason why AAS antennas were not additionally considered in the single entry study.Can you please confirm our understanding that the single entry results of study A represent a static worst-case scenario where the BS is always pointing with peak antenna gain and transmits always with maximum output power towards the direction of the FSS ES antenna? | Study A only considers non-AAS antennas. Having received comments that AAS needed to be simulated, we have developed study B to provide a generic study applicable to all locations to complement the results of study A. The non-AAS is assumed to be pointing in azimuth towards the FSS ES. However, the mechanical downtilt of the BS antenna was considered as well as terrain and clutter in combination of P.452. In addition, the FSS ES is pointing in a specific azimuth and elevation and therefore this study is not worst case. |
| Nokia #2 | Non-AAS BS Parameters(Study A) | In Table 3 of Study A, Maximum BS output power = 64dBm and antenna gain = 18dBi. The combination of both produces a Maximum EIRP =82dBm. The document 5A/589 which is referenced to provide the non-AAS parameters specifies that for Macro cell BS, the Maximum EIRP = 64dBm for 40MHz bandwidth. We would like to seek clarification under what justification the maximum EIRP in study A was considered to be 18dB higher than the guidance of the referenced 5A/589 document. | We have followed the guidance from 5A/589. This is an editorial mistake and the maximum output power should be 49dBm/40MHz. Then taking the 3dB feeder loss and the 18 dBi gain we get the 64dBm/40MHz max eirp. |
| Nokia #3 | Earth station parameters and locations(Study A) | Study A references existing locations for earth stations. We would like to ask whether it would be possible to identify and provide the exact locations of the FSS Earth stations (i.e. Longitude/Latitude). Furthermore, as per text above Table 1 “FSS parameters are based on characteristics provided by ITU-R WP4A as well as on characteristics of existing FSS ES where indicated”. Table 1 indicates that only antenna size, ES pointing and ES location parameters are taken from existing FSS ES. Can you please clarify why the rest of the parameters (e.g. operating frequency range, carrier bandwidth, noise temperature, antenna height) were not based on the existing FSS ES? How different are they compared to the parameters given from WP4A?We would also like know where in the document the results of the 12m FSS ES antenna (which as per Table 1 is based on existing FSS ES locations) are shown. | The locations were taken from internal databases. We will examine the possibility of sharing the coordinates of these stations. The main parameter that has impact on the result was mainly the antenna pointing and location of the antenna. The antenna noise were in the range of those provided by WP4A and therefore the parameters provided by WP4A were used. The antenna height was not readily accessible hence our choice to assume 10m height. |
| Nokia #4 | Study B | Which of all the available FSS ES parameters were used to derive the CDF curves and the separation distances shown in study B?Regarding the “adjacent band” studies under 1.2.3. The study examines Mobile BS transmissions in 3.4-3.8 GHz (400MHz) towards FSS ES in 3.4-4.2 GHz. We would like to ask how the derivation of the suggested threshold of I/N = -20dB was made, since it is not directly referenced in ITU-R S.1432-1 and was not included in the LS of WP4A. | see answer to questions 2 and 4 from China |
| China #1 | Below rooftop ratio (Study B) | In Table 1 of study B, the value of below rooftop ratio is given as '50%' in suburban and rural scenarios, which is different from the value (0%) of Doc 5A/378. Could you please clarify your consideration for using the value of '50%' ? | Thank you for highlighting this editorial mistake. The ratio value should be 0% below rooftop for suburban and rural scenarios. The study was conducted with 0% for suburban and rural, this mistake is therefore editorial in this table. |
| China #2 | FSS ES parameters (Study B) | We note that the whole parameters of FSS ES are listed in the table. Could you please clarify which set of parameters of FSS ES was used in study B ?. | The study assumes the off-axis reception of the FSS ES from the BS cluster when pointing at 10 degrees elevation. Following S.465, with that configuration, the off-axis gain of the FSS ES would be the same regardless of the FSS ES diameter. Therefore the study is valid for all antenna sizes. Since the study is applicable for all diameters, the noise temperature of 70K was assumed. |
| China #3 | Polarization loss (Study B) | Could you please provide the reason for not considering polarization loss ? | Polarisation in a signal is mainly perceived in the main beam. In this sharing scenario case, all interference is received in the off-axis. Polarisation loss is therefore not a given in this case. Some recommendations such as F.1245 for the FS (see NOTE 7) indicate that polarisation loss can be considered only in the 3dB beam width of the antenna and only for 1.7dB. Since we are not in the 3 dB beamwidth of the FSS ES, we decided not to consider this polarisation loss. |
| China #4 | FSS protection criteria (Study B) | The WP4A has not reached an agreement on the adjacent frequency protection criteria. We think that the protection criteria used in study B is inappropriate. | WP4A discussions were unable to reach agreement, however, existing recommendation ITU-R S.1432 provides guidance on this criteria and was used in previous cycle studies. We provide the rationale for this assumption in section 1.2.1.2 of Study B. |

**FS study**

**Doc 5A/554 (China)**

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| **ID** | **Topic** | **Question** | **Response from source of study** |
| GSOA #1 | P.452 %time | The study describes a Monte Carlo analysis. Why is a fixed 50% time used in P.452 propagation model? This value should be randomised at each step. Assuming 50% overestimates propagation loss.  | Technically, the Monte Carlo method is static simulation, it is not time-driven, so it cannot be directly matched with the time percentage. However, in order to reflect the time percentage in protection criteria of the interfered system, snapshots can be used to approximate the time slice, and then a certain probability value is taken on the I/N CDF curve to represent the time percentage in the protection criterion. The premise of this approach is that the number of snapshots is sufficient (to ensure that the simulation results can converge), and the values of each random variable in the simulation should avoid repeated screening by additional constraints.Based on the above description, in our simulation, the time percentage in protection criterion has been reflected by I/N CDF.The propagation loss is not independent from other variables (such as percentage of location, BS beam pointing), if the time percentage in protection criterion (e.g. 20%) used in the propagation model, and then get the percentage from the CDF (e.g. 80%) again, it means the time percentage considered twice, as a result, the final percentage is not the time percentage in protection criterion (e.g. 20%), it is the superposition of the 2 percentages, which will overestimate the interference.Therefore, we think it is relatively fair to select 50% time percentage for the propagation model, because 50% is a median, the final time percentage in protection criteria reflected by the value of CDF is reasonable. |
| GSOA #2 | Scenario | "negative direction", i.e. FSS ES main beam pointing away from MS BS: how is this scenario useful to assess potential interference to FSS ES? | The ‘negative direction’ is considered as a better case since the ‘positive direction’ is considered as a worse case. From the study results, we can see that the main interference is from main beam, compared with main beam, the interference from back lobe is much smaller. |
| GSOA #3 | Clutter | As per section 1.1.2.1 the study seems to consider application of clutter following P.2108 statistical model on both the FS and MS side. Can you please confirm? Could you please explain the rationale for applying such clutter consistently on both sides? ITU-R P.2108 statistical model was developed based on measurements at 6m heights and is applicable only when the stations are "well within the clutter". We note that even a 60m antenna height for FS was also considered. | In this study, for FS station with 60 m antenna height, only MS side has clutter loss, the FS station side has no clutter loss, for FS station with 20 m antenna height, clutter loss is considered at both MS side and FS station since there may be many surrounding buildings higher than 20m. |
| GSOA #4 | Protection criteria | We see that only the long term protection criteria is considered. Why wasn't the short term protection criteria considered? | The simulation results are only compared with the long-term protection criteria. If needed, the short-term criterion results will be provided in our future update study. |
| GSOA #5 | CDF curves | No intermediary nor final results are provided. Could these be added to this study? | Yes, of course, we will provide the CDF curves in the update document. |
| GSOA #6 | TDD and NLF | The study seems to account for the TDD and NLF of BS by reducing the amount of interference by these factors. Could you please confirm? If that is the case, since the interference is often driven by one dominant interferer, that methodology seems invalid. The method should consider the number of active BS at every time steps. For example in the study there are 19 BS = 57 sectors. At every time step, TDD\*NLF\*57 = 0.75\*0.5\*57 = 21 sectors are active. | In our study, we considered 57 sectors in one place, we think in such scenario these sectors are synchronous, (if consider large area simulation, maybe not this case), it means that 75% time, all BSs transmitting, 25% time all UE are transmitting, so it more relevant with average of time, so it is not 75% number of BSs are transmitting at one snapshot, maybe 75% BSs interference plus 25% UEs interference in is more appropriate. We only provided 75% BSs this time, we will consider to add 25% UEs interference in future meetings. The value of NLF are used to obtain the active BSs. |
| GSOA #7 | Polarisation | Was polarisation loss considered in this study? If so how much and what is the rationale for that polarisation loss?  | 3dB polarization loss is used for the aggregate interference study. The polarization of BSs and FS station side are not the same due to different locations and antenna point direction of BSs. Therefore 3dB average loss is considered. |
| Russia #1 | Application of propagation model in P.452 | Section 1.1.1.3 states that 50% time percentage is used as a parameter for P.452. Since long-term FS protection criterion is specified for 20% of the time, application of 50% time percentage for P.452 overestimates propagation losses and does not allow to compare resulting I/N figures with FS protection criterion and draw any conclusions on possibility of sharing with FS. Additional studies with proper t% (20%) are required. | Technically, the Monte Carlo method is static simulation, it is not time-driven, so it cannot be directly matched with the time percentage. However, in order to reflect the time percentage in protection criteria of the interfered system, snapshots can be used to approximate the time slice, and then a certain probability value is taken on the I/N CDF curve to represent the time percentage in the protection criterion. The premise of this approach is that the number of snapshots is sufficient (to ensure that the simulation results can converge), and the values of each random variable in the simulation should avoid repeated screening by additional constraints.Based on the above description, in our simulation, the time percentage in protection criterion has been reflected by I/N CDF.The propagation loss is not independent from other variables (such as percentage of location, BS beam pointing), if the time percentage in protection criterion (e.g. 20%) used in the propagation model, and then get the percentage from the CDF (e.g. 80%) again, it means the time percentage considered twice, as a result, the final percentage is not the time percentage in protection criterion (e.g. 20%), it is the superposition of the 2 percentages, which will overestimate the interference.Therefore, we think it is relatively fair to select 50% time percentage for the propagation model, because 50% is a median, the final time percentage in protection criteria reflected by the value of CDF is reasonable. |
| Russia #2 | FS Protection criterion | Rec. F.758 indicates that The long- and short-term interference levels, and associated time percentages, must be individually derived for each FS system type in accordance with the principles described in Annex 1 of the Recommendation. What is the reason to use only long-term interference criterion for FS in the study? | The simulation results are only compared with the long-term protection criteria. If needed, the short-term criterion results will be provided in our future update study. |
| Russia #3 | Application of Clutter loss | Section 1.1.1.3 states that the model defined in Recommendation ITU-R P.2108-1 is used in order to reasonably calculate the clutter loss. Section 1.1.2.1 states that urban and suburban macro scenario are considered in the simulation to calculate the interference from mobile service BSs to FS station. For clutter loss model, the cases of both sides are considered in this study. Taking into account that MS BS antenna height is 20/25 m for Urban/Suburban macro deployments with below rooftop base station antenna deployment of 50/0% percent, and FS station antenna height is 20/60 m, the use of clutter model from section 3.2 of P.2108, applicable only for terminals well within clutter, needs to be justified. Corresponding percent of BS in Urban/Suburban macro deployments should be excluded from application of clutter loss for all of the snapshots. Alternatively, nominal clutter heights and distances from P.452 could be applied to calculate clutter loss. | Below-rooftop does not mean below the clutter and similarly above-rooftop does not indicate above the clutter. A BS can be located above rooftop but there can be higher buildings surrounding the building rooftop where the MS BS is deployed. Therefore clutter loss should be applied to all base stations. In urban/suburban scenario, there may be many surrounding buildings higher than 20/25m, considering different building height surrounding, clutter loss are different. The percentage of location is random in our study, it means that different clutter loss values have been considered including the low clutter loss cases. |
| Russia #4 | Application of TDD and NLF factor | It is not clear from the study, whether NLF was used. Clarification is required in the text of the study. Section 1.1.2.2 (formulae 2) indicates that the aggregate interference power density from all BS is calculated by scaling down interference from each BS by FTDD, which underestimates the level of interference into FSS. Taking into account that the total number of interfering BS (sectors) is low, interference into FS station is dominated by single/several BS, pointing twds FS station. FTDD should be used to limit the total number of active BS for each snapshot. | Yes, the NLF is used, we will add the text of NLF in the study. In our study, we considered 57 sectors in one place, I think in such scenario these sectors are synchronous, it means that 75% time, all BSs transmitting, 25% time all UE are transmitting, so it more relevant with average of time, so it is not 75% number of BSs are transmitting at each snapshot, maybe 75% BSs interference plus 25% UEs interference in is more appropriate. |
| Russia #5 | BS gain CDF | In order to compare results, BS antenna gain CDF towards horizon (elevation angle 0 degree) is essential (for single sector, pointing towards FS station). | We can provide the BS antenna gain CDF in the next meeting if time and resources are permitted. |
| Russia #6 | BS deployment | Is sector orientation for BS fixed in all snapshots? | The sector orientation of BS are fixed. |
| Russia #7 | MS stations with Non-AAS patterns | Probability of interference for MS stations with Non-AAS patterns would be higher, taking into account fixed geometry, however sharing studies for non-AAS MS stations are not provided, which does not allow to draw conclusion on possibility of sharing between MS and FS. Additional studies are required. | Currently, the study focuses on AAS stations, non-AAS is not considered yet, maybe we will do the simulation in our future study. |