

Name: APERR_001V01**Description:****Type:** Earth station, Receiving and Transmitting

Appendix 8 Earth station antenna pattern for GSO networks. Only for maximum antenna gain greater than 9.3 dB.

Region(s): 123**Required Input Parameters:**

gain

Validation Warnings/Errors:

Type	Message
Warning	Phib () is less than Phir ().

Pattern Information:

The pattern is used for the determination of coordination requirements between GSO networks sharing the same frequency band for non-planned services.

Co-Polar Component:If $D/\lambda \geq 100$:

$$\begin{aligned}
 G &= G_{\max} - 2.5 \times 10^{-3} (D/\lambda \cdot \varphi)^2 && \text{for } 0^\circ \leq \varphi < \varphi_m \\
 G &= G_1 && \text{for } \varphi_m \leq \varphi < \varphi_r \\
 G &= 32 - 25 \log \varphi && \text{for } \varphi_r \leq \varphi < \varphi_b \\
 G &= -10 && \text{for } \varphi_b \leq \varphi \leq 180^\circ
 \end{aligned}$$

If $D/\lambda < 100$:

$$\begin{aligned}
 G &= G_{\max} - 2.5 \times 10^{-3} (D/\lambda \cdot \varphi)^2 && \text{for } 0^\circ \leq \varphi < \varphi_m \\
 G &= G_1 && \text{for } \varphi_m \leq \varphi < \varphi_r \\
 G &= 52 - 10 \log (D/\lambda) - 25 \log \varphi && \text{for } \varphi_r \leq \varphi < \varphi_b \\
 G &= 10 - 10 \log (D/\lambda) && \text{for } \varphi_b \leq \varphi \leq 180^\circ
 \end{aligned}$$

where:

$$D/\lambda = 10^{\left(\frac{G_{\max} - 7.7}{20}\right)}, \quad \varphi_m = 20 \lambda/D \sqrt{G_{\max} - G_1}.$$

$$G_1 = 2 + 15 \log (D/\lambda), \quad \varphi_b = 48^\circ.$$

$$\begin{aligned}
 \varphi_r &= 15.85 (D/\lambda)^{-0.6} && \text{for } D/\lambda \geq 100, \\
 &= 100 \lambda/D && \text{for } D/\lambda < 100.
 \end{aligned}$$