Satellite Communication

Assignment II

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1) Cross polar discrimination

$$XPD = 20 \log \frac{|E_{11}|}{|E_{22}|}$$

E_{11} = received polarized electric field Straigth

E_{22} = $\vec{E}$ coupled to orthogonal polarization.

Cross polar isolation

$$XPI = 2 \log \frac{|E_{11}|}{|E_{21}|}$$

↳ cross polar component.

\# A → coplanar attenuation 'A'

$$XPD = V - v \log(A) \, dB$$

↳ empirical constants depends on frequency, polarisation, elevation angle and casting angle.

$$U = 30 \log(f) - 40 \log(\cos\theta) - 20 \log \sin(\tau)$$

τ → Polarisation tilt angle w.r.t horizontal

θ → elevation angle in (°)

$$\Rightarrow V = 20, \quad 8 < f < 15 \text{ GHz}$$

$$= 23, \quad 15 < f < 35 \text{ GHz}$$