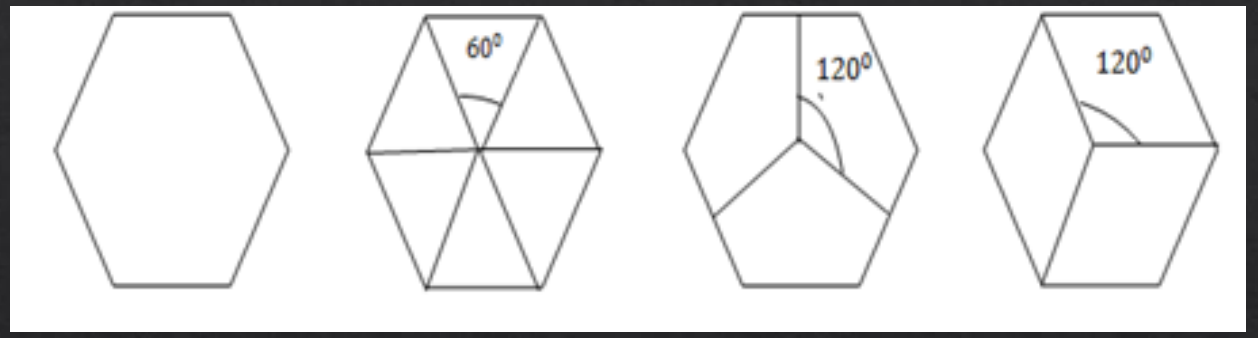
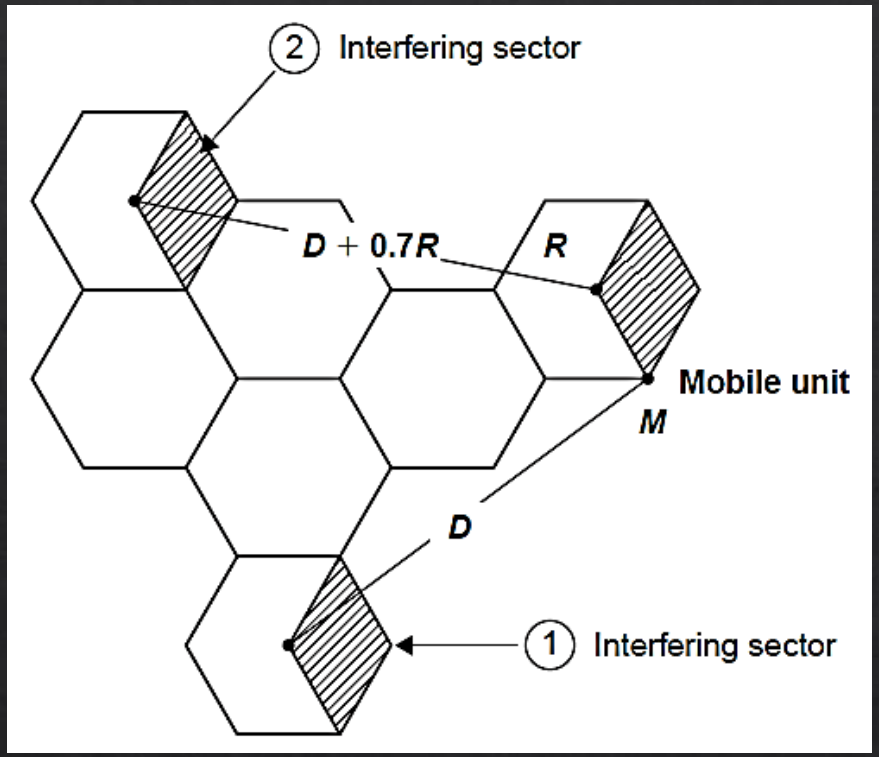
Cochannel Interference Reduction using Directional Antenna



Omnidirectional 60° (6 Sectors) 120° (3 Sectors)

Each cell is divided into three or six sectors and uses three or six directional antennas at the base station to reduce the number of cochannel interferers

• Three-Sector Case

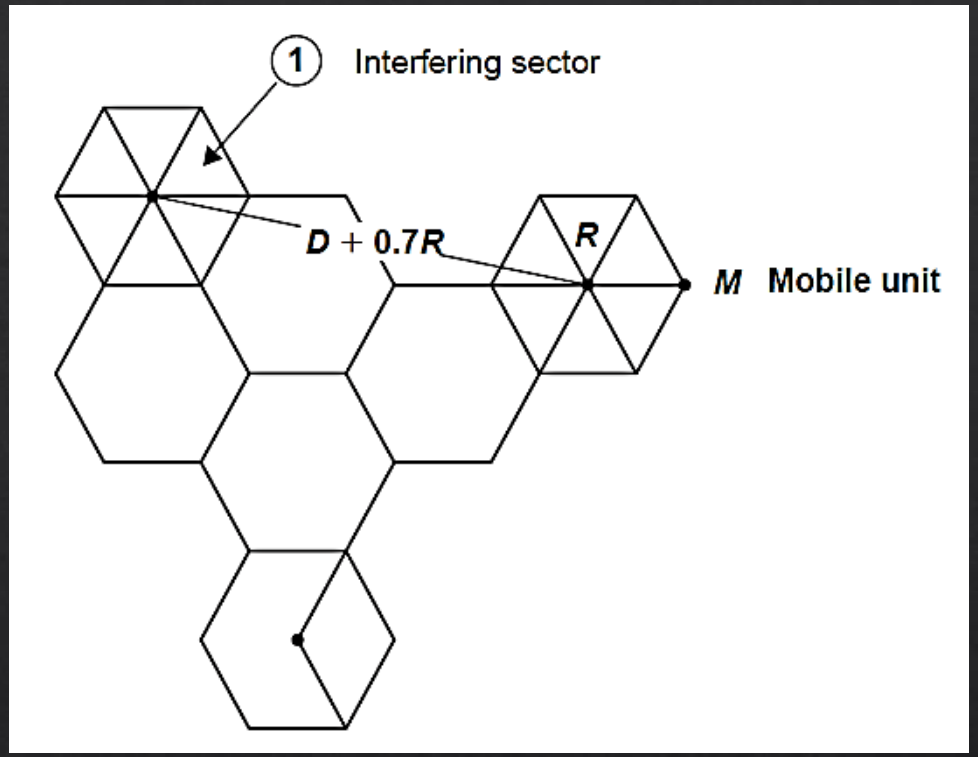


$$\frac{S}{I} = \frac{R^{-4}}{D^{-4} + (D + 0.7R)^{-4}}$$

$$\frac{S}{I} = \frac{1}{q^{-4} + (q + 0.7)^{-4}}$$

for $N = 7$, $q = 4.6$, we get S/I =285 or 24.5 dB

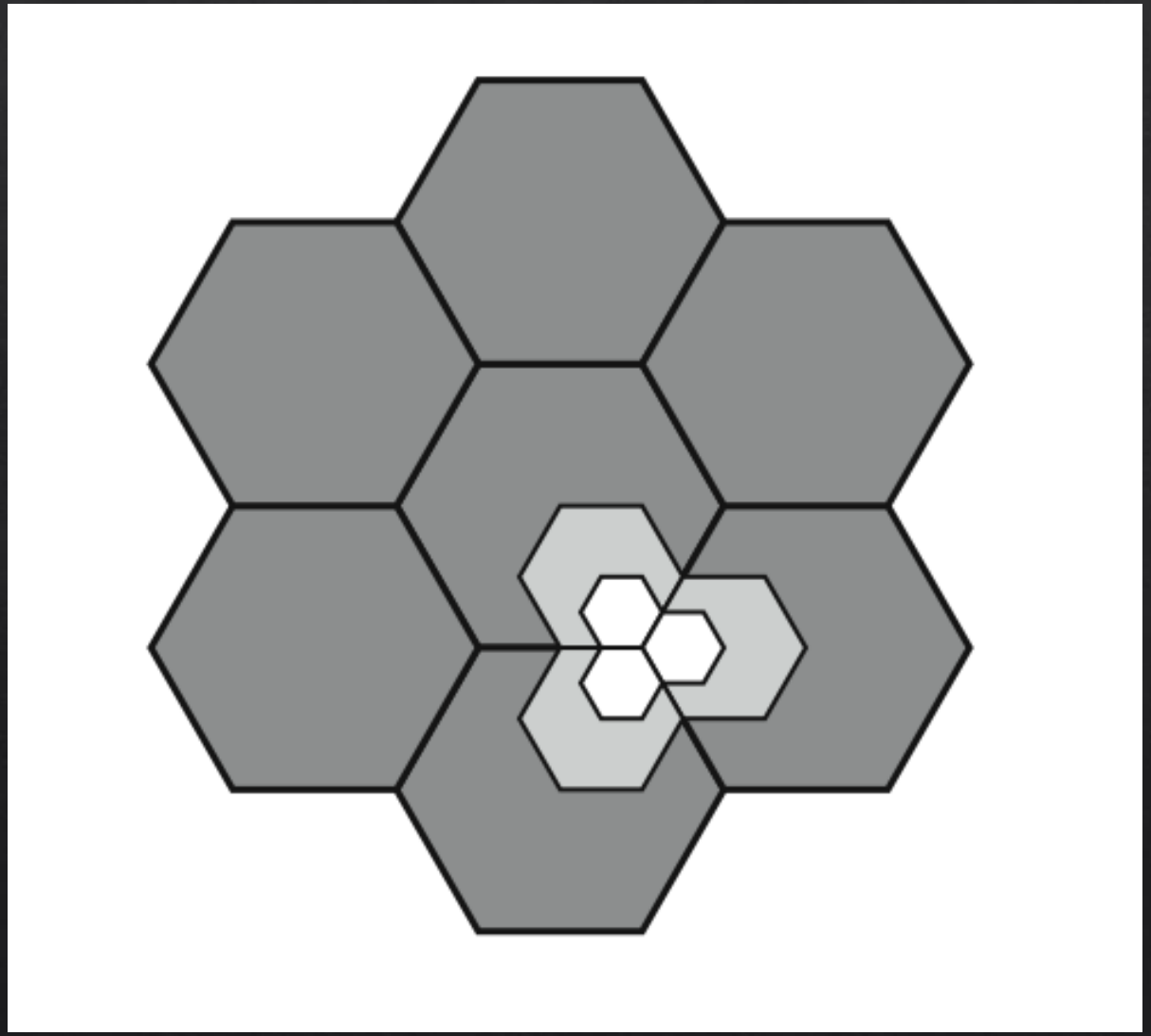
• Six-Sector Case



$$\frac{S}{I} = \frac{R^{-4}}{(D + 0.7R)^{-4}} = (q + 0.7)^4$$

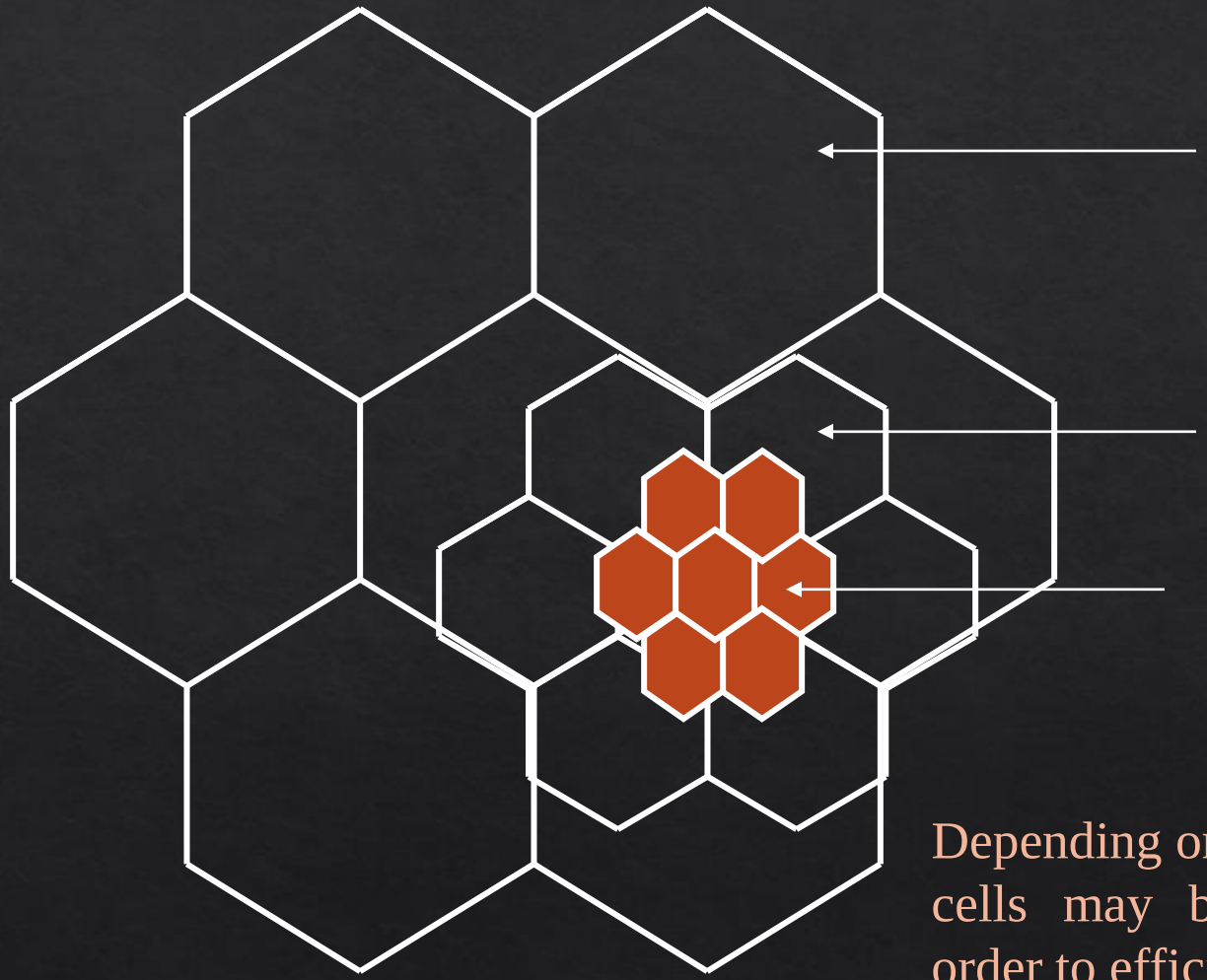
For N = 7, q = 4.6, S/I = 789 or 29 dB

Cell Splitting



Cell splitting is the process of subdividing a congested cell into smaller cells, each with its own base station and a corresponding reduction in antenna height and transmitter power.

Cell Splitting



Depending on traffic patterns the smaller cells may be activated/deactivated in order to efficiently use cell resources.