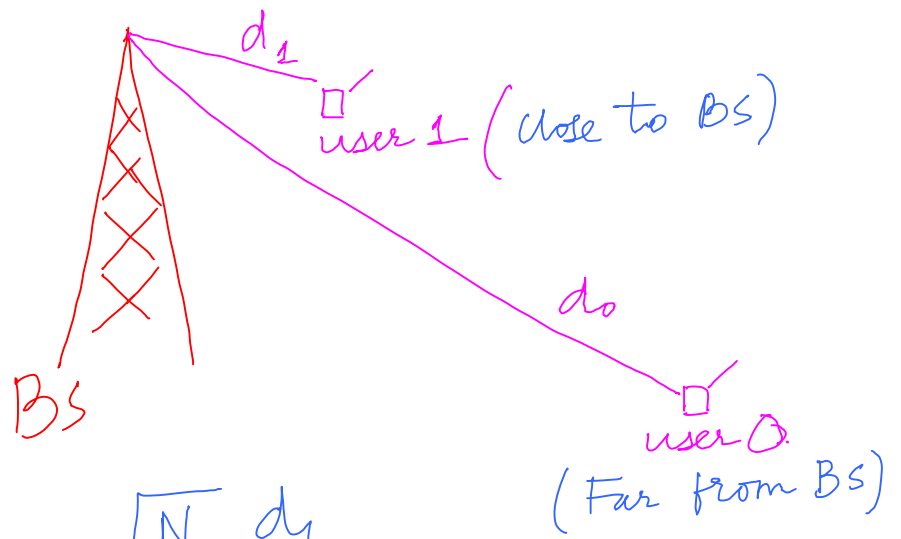


Near Far Problem in CDMA:

Consider a 2 user CDMA
scenario,

$$SINR = \frac{|h|^2 P_o}{\underbrace{\frac{|h|^2 P_i}{N}}_{\text{Multisuser Interference}} + \underbrace{\frac{\sigma^2}{N}}_{\text{Noise power}}}$$

$|h|^2 P_o$ } signal power



$$d_0 = \sqrt{N} d_1$$

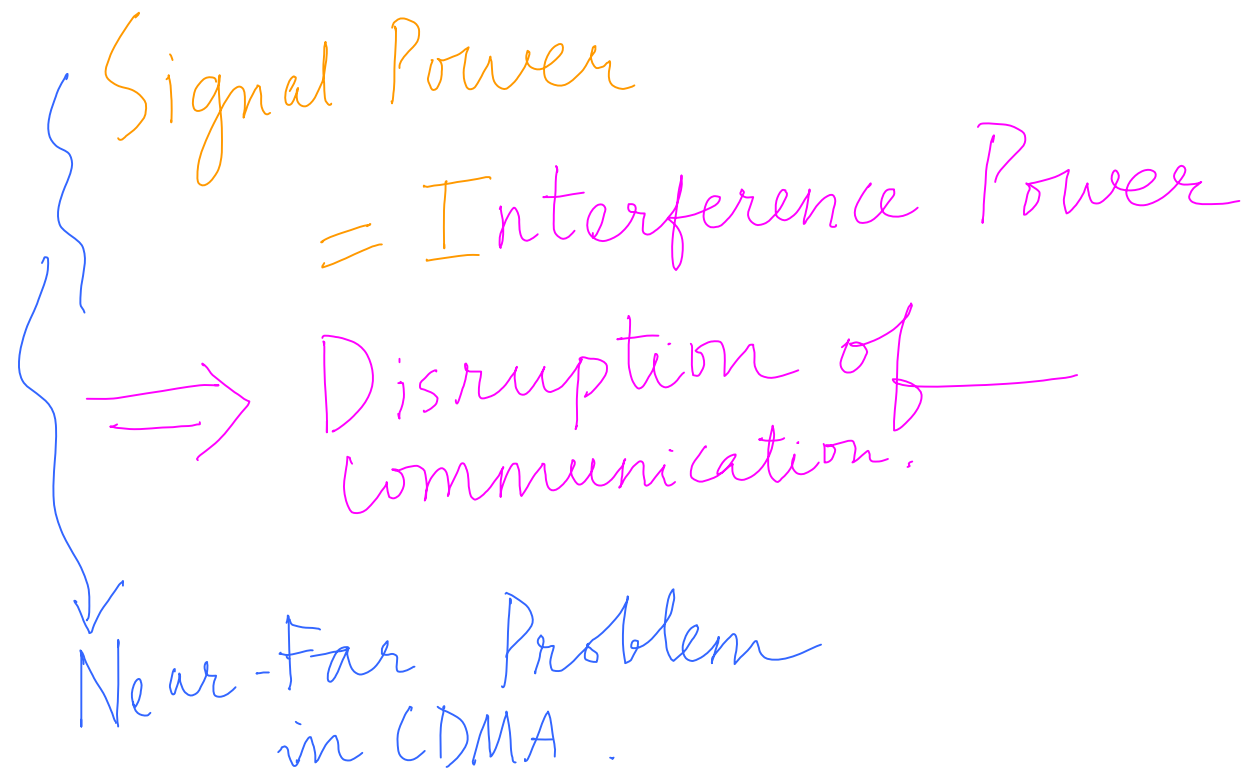
$$d_0 = 16 d_1 \quad \text{if } N = 256.$$

If Transmit power is P .

$$P_1 = \frac{P}{d_1^2}$$

$$P_0 = \frac{P}{d_0^2} = \frac{P}{(\sqrt{N} d_1)^2} = \frac{P}{N d_1^2}$$

$$\text{SINR} = \frac{\underbrace{|h|^2 \frac{P}{N d_1^2}}_{\text{Signal Power}}}{\underbrace{|h|^2 \frac{P}{N d_1^2}}_{\text{Interference Power}} + \frac{\sigma^2}{N}}$$



Near Far Problem:

↳ where a close interferer suppresses the signal of another user in CDMA system.

✓ Power Control is important in CDMA systems.