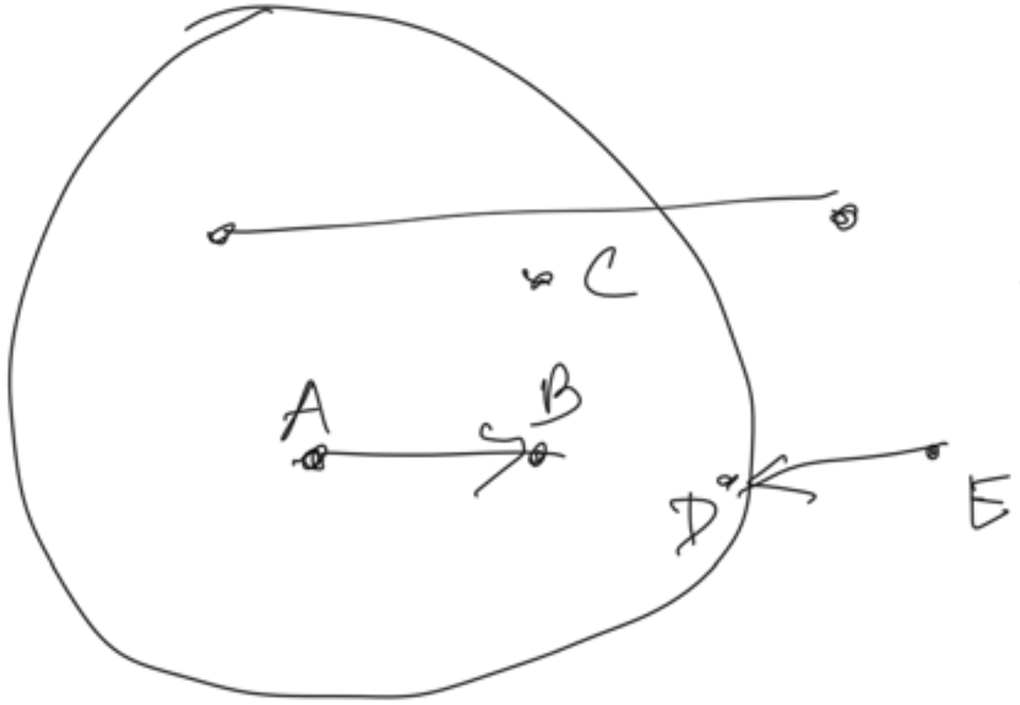
pages.cs.wisc.edu/~suman/courses/wiki

PCMA (Power Controlled Multiple Access)



P_R

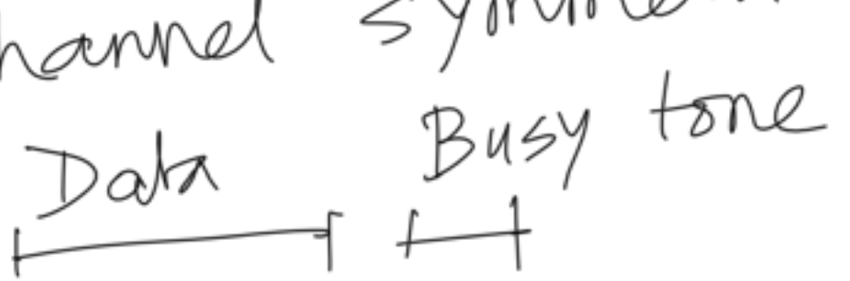
↳ Rx Thresh

SINR > SINRThresh

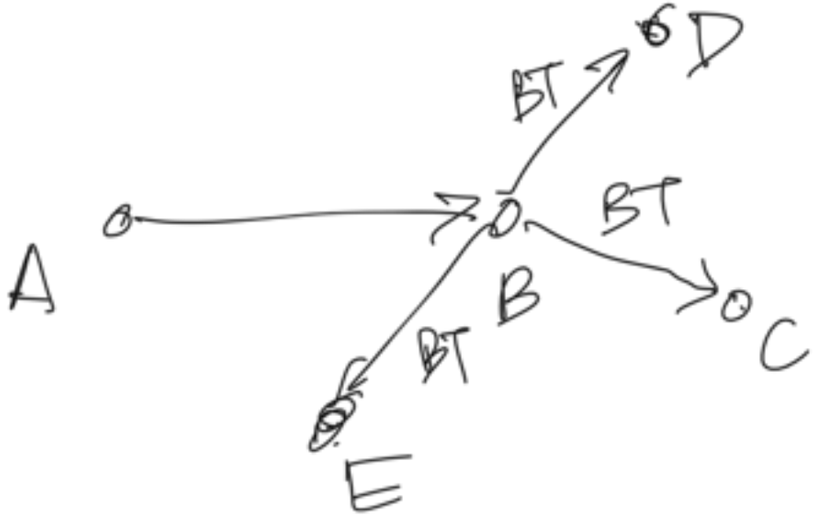
Spatial Reuse

Assumptions

Channel symmetric



$C = B \log(1+SNR)$



Cooperation principle

Power conserving

Constraints

1) $P_{t\_min} \leq P_{t_i} \leq P_{t\_max}$

RX_Thresh

SIR_Thresh

2) $G_{ij} P_{t_i} (\text{Rx at } j) \geq \text{RX\_Thresh}$

3) For j. N_j → noise of j

$$\frac{P_r}{I+N}$$

$$\downarrow$$

$$\sum_{l \neq i} G_{lj} P_{t_l}$$

$$\frac{G_{ij} \cdot P_{ti}}{\sum_{l \neq i} G_{lj} P_{t_l} + N_j} \geq \text{SIR\_Thresh}$$

4) Noise tolerance

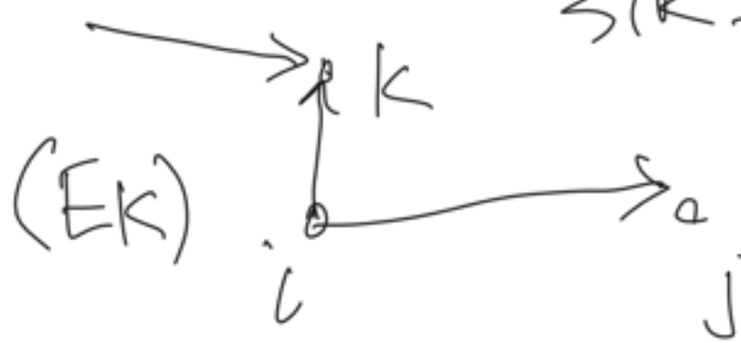
$$E_k = \frac{P_{r_k}}{SIR\_Thresh} - P_{n_k}$$

Node k

$$\rightarrow P_{n_k} = \sum_{l \neq i} G_{lk} P_{t_l} + N_k$$

$$SIR\_Thresh = \frac{P_{r_k}}{P_{n_k} + E_k}$$

$$P_{n_k} + E_k = \frac{P_{r_k}}{SIR\_Thresh} - P_{n_k}$$



$$P_{i} \cdot G_{ik} \leq E_k$$

$$P_{ti} \leq \frac{E_k}{G_{ik}}$$

$$P_{ti} \leq \min_k \left\{ \frac{E_k}{G_{ik}} \right\}$$