

Digital Communication Systems

ECS 452

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8. Optimal Detection for Additive Noise Channels

1-D Case



Office Hours:

BKD, 4th floor of Sirindhralai building

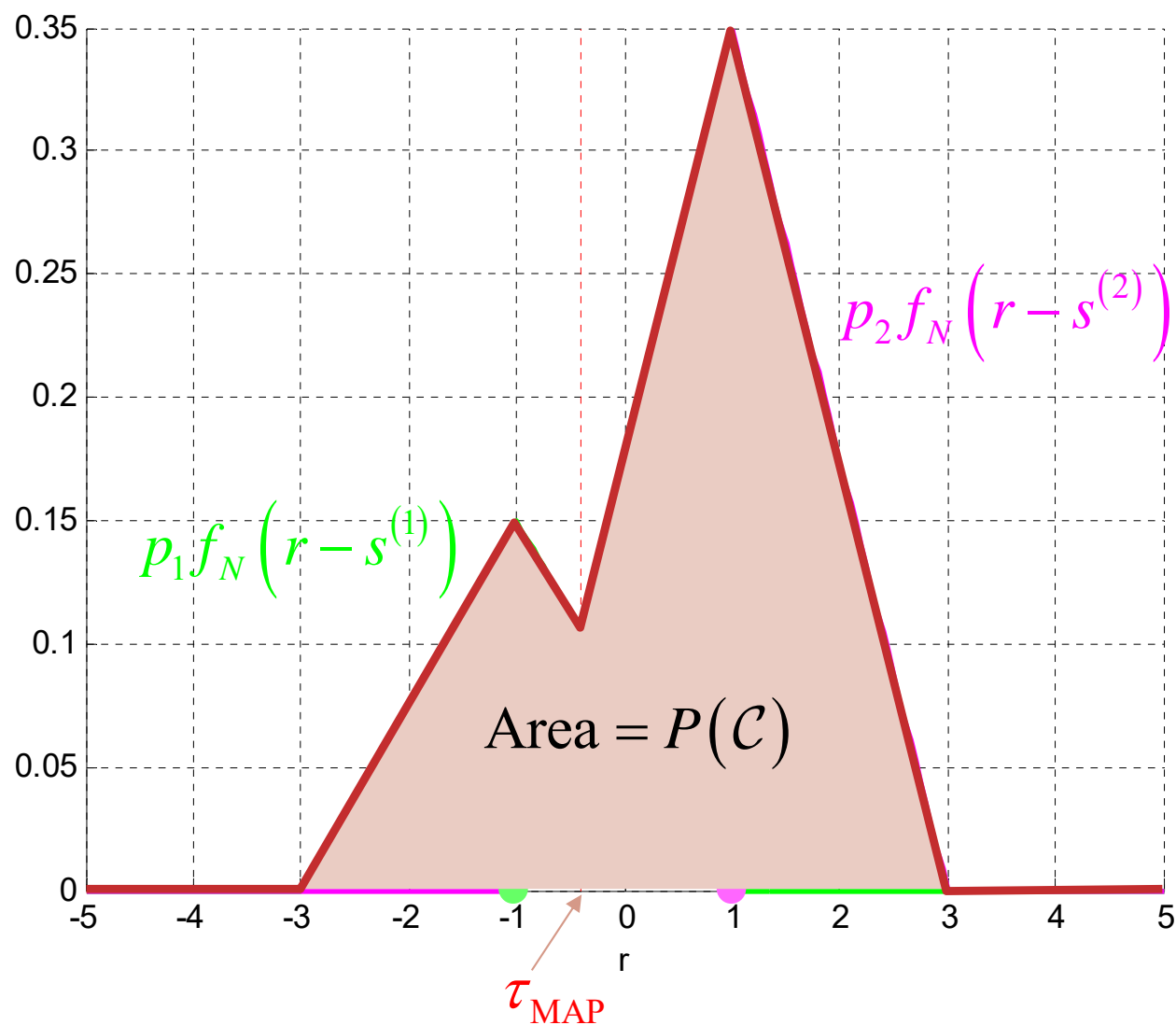
Monday 14:00-16:00

Thursday 10:30-11:30

Friday 12:00-13:00

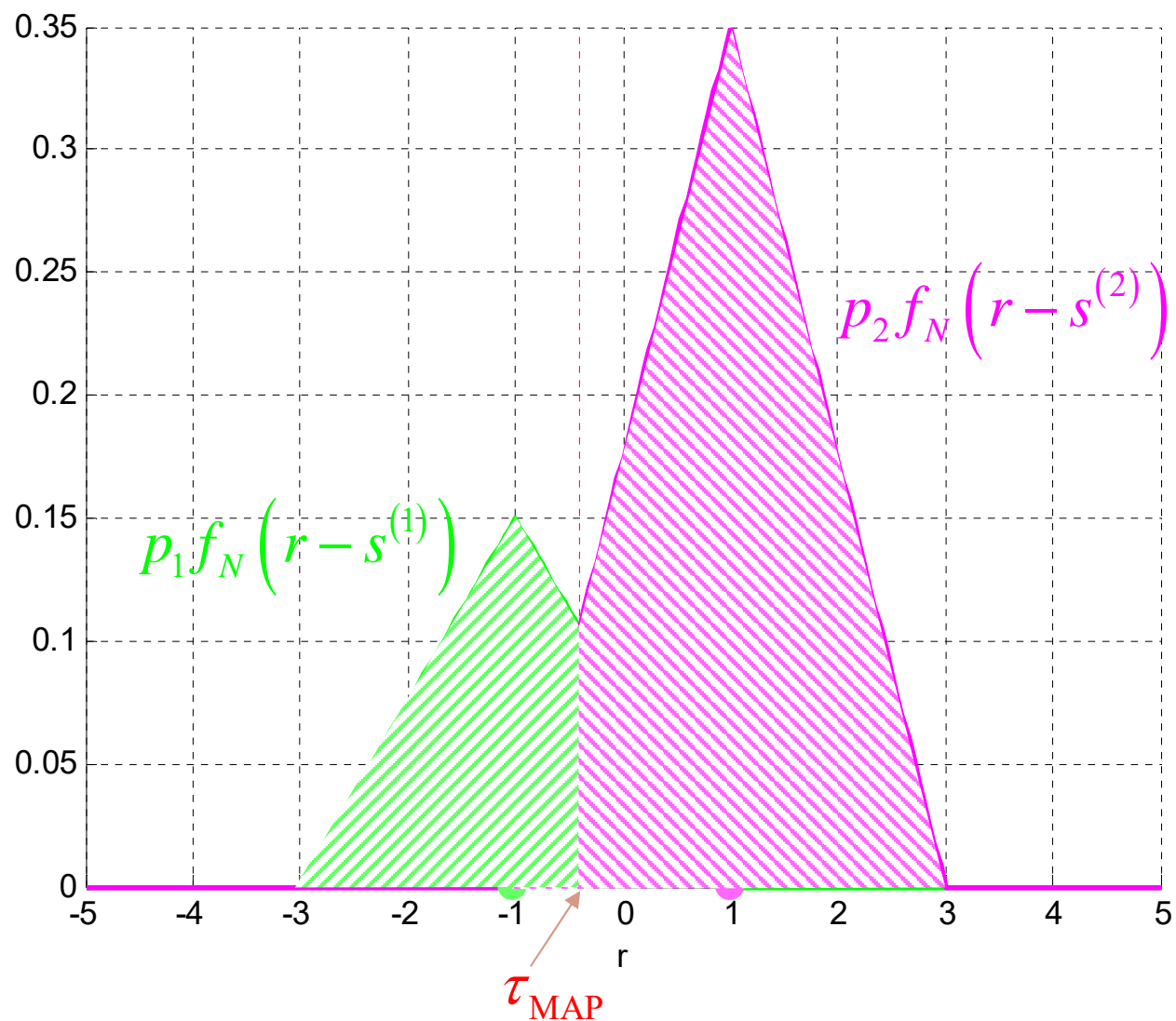
Error Probability

Ex. Binary PAM under “Triangular” Noise



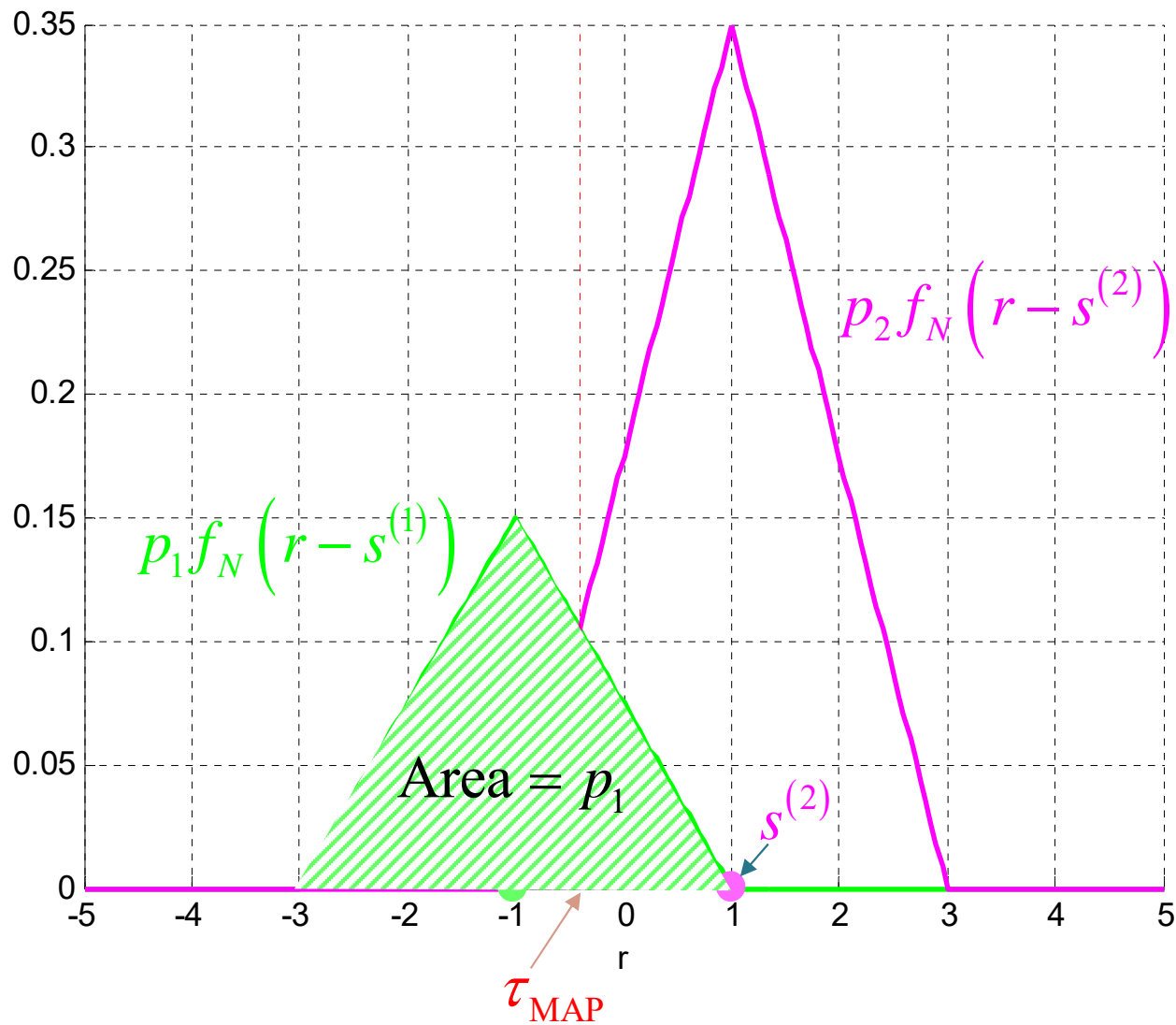
Error Probability

Ex. Binary PAM under “Triangular” Noise



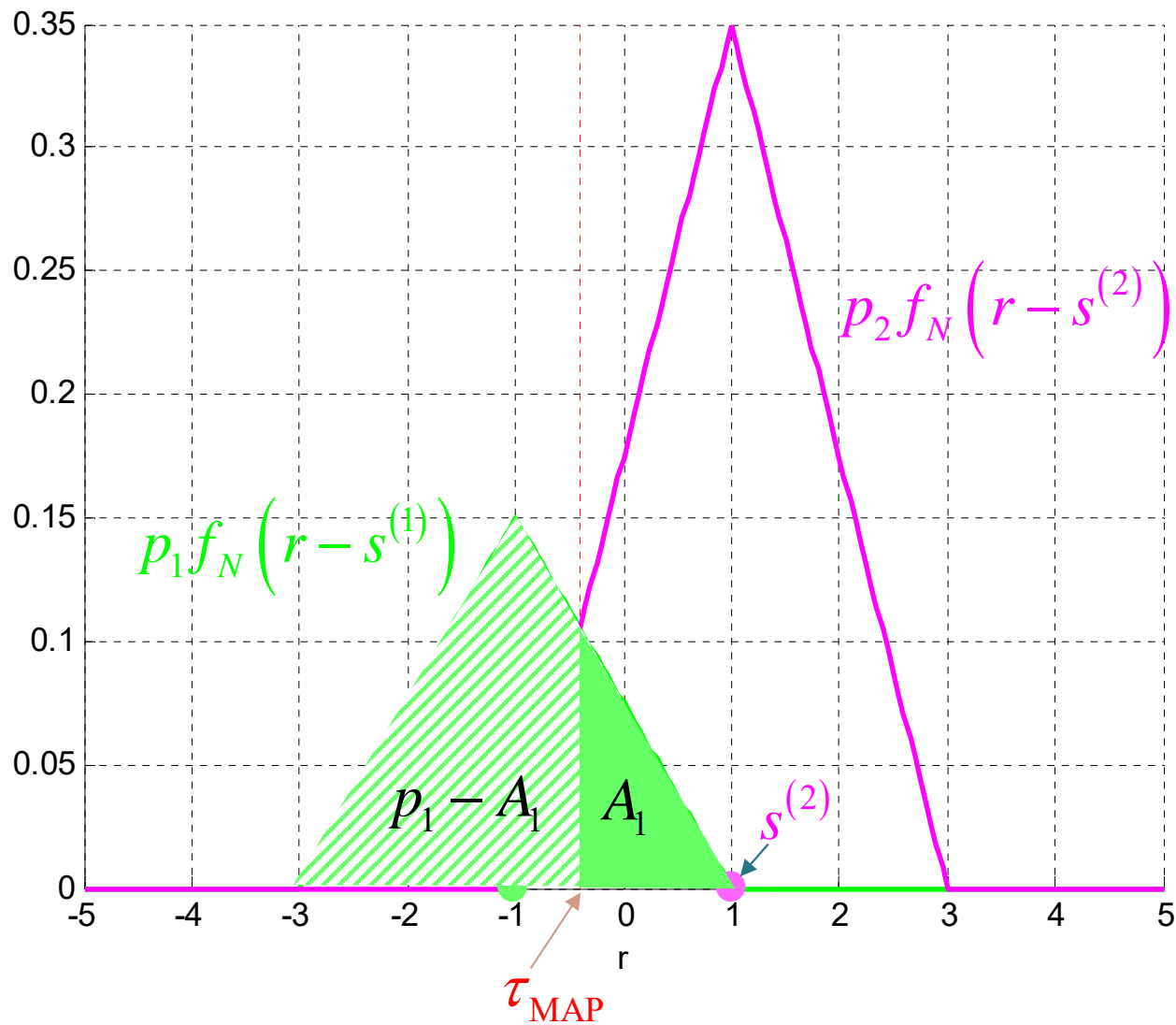
Error Probability

Ex. Binary PAM under “Triangular” Noise



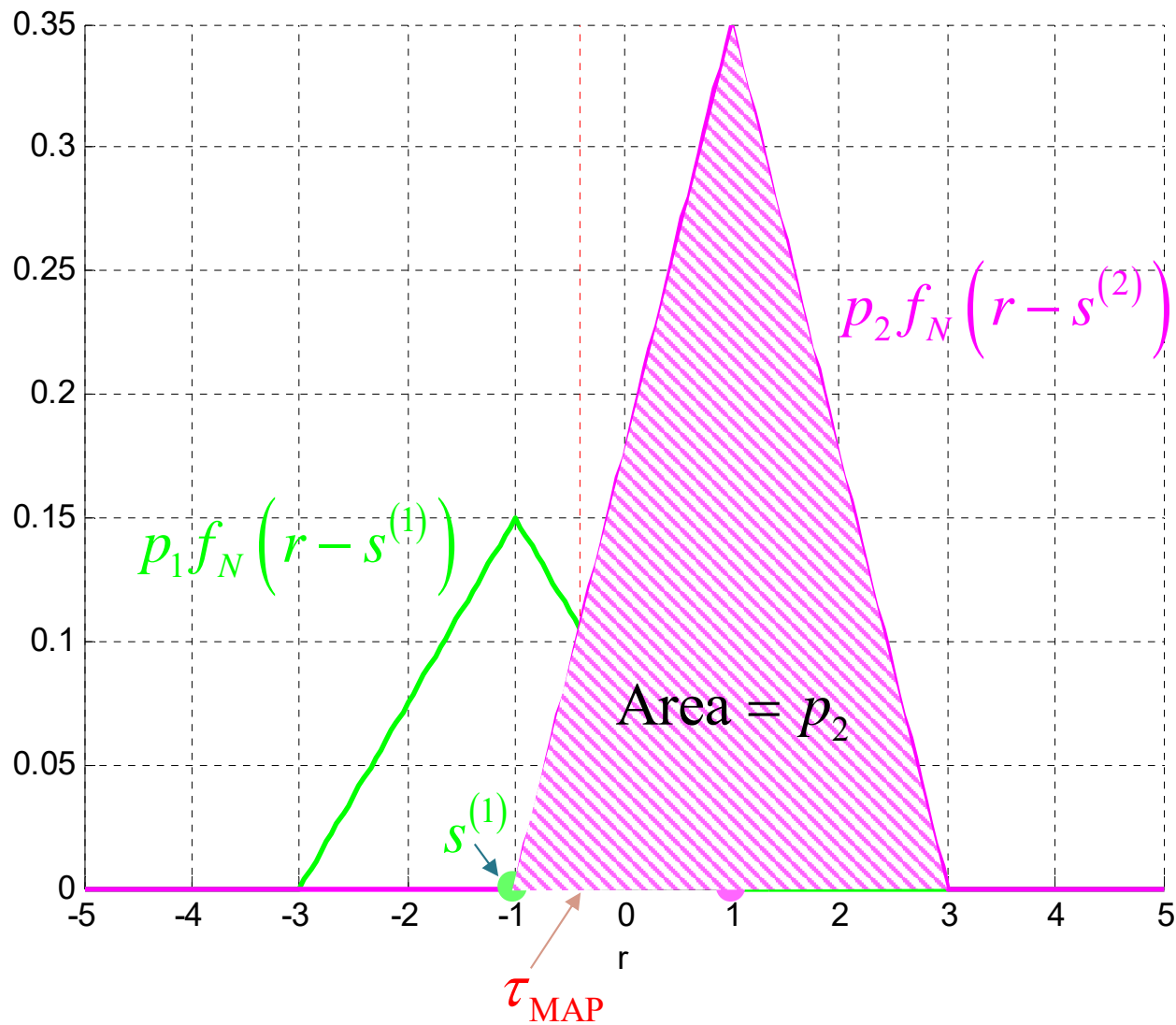
Error Probability

Ex. Binary PAM under “Triangular” Noise



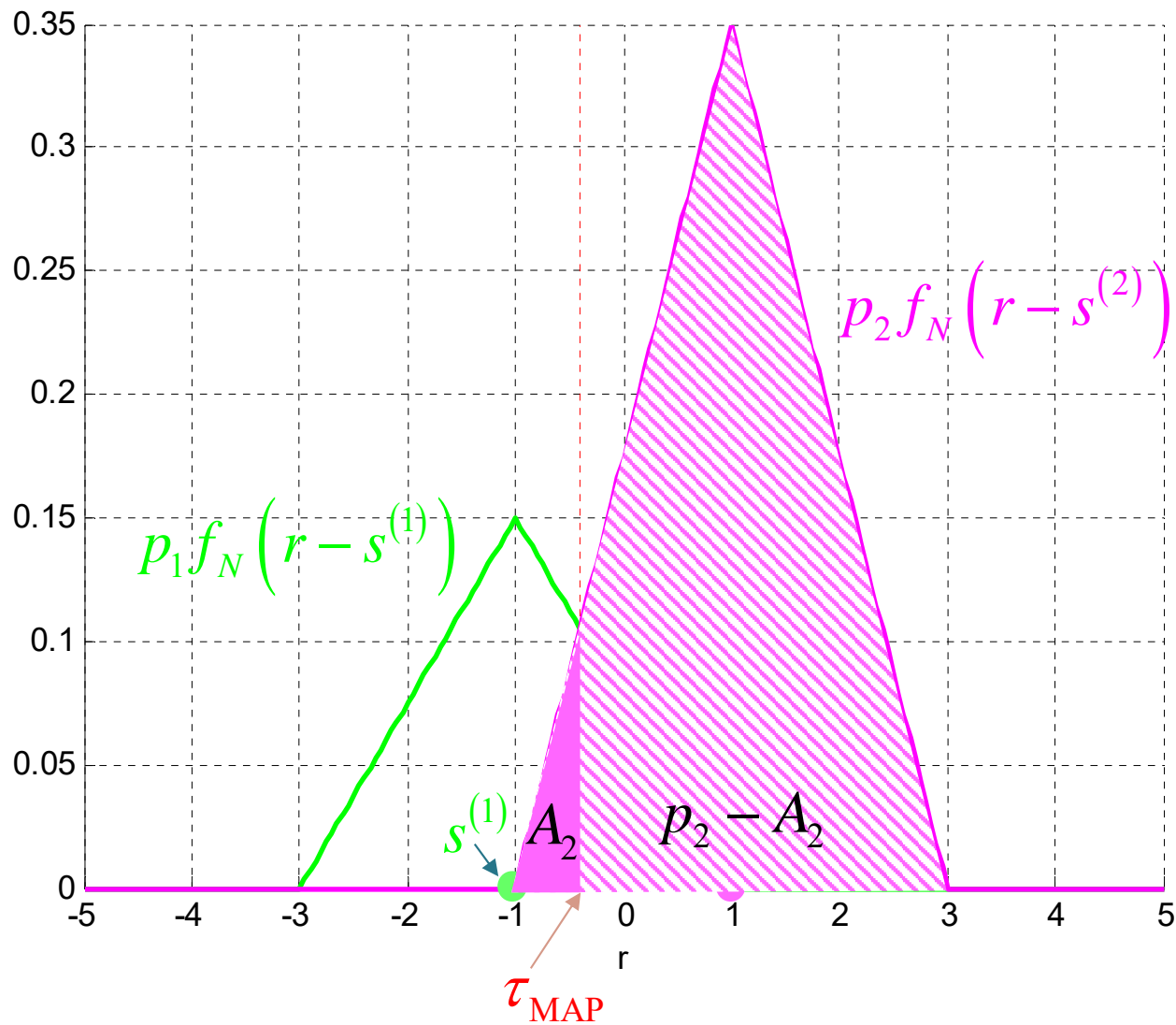
Error Probability

Ex. Binary PAM under “Triangular” Noise



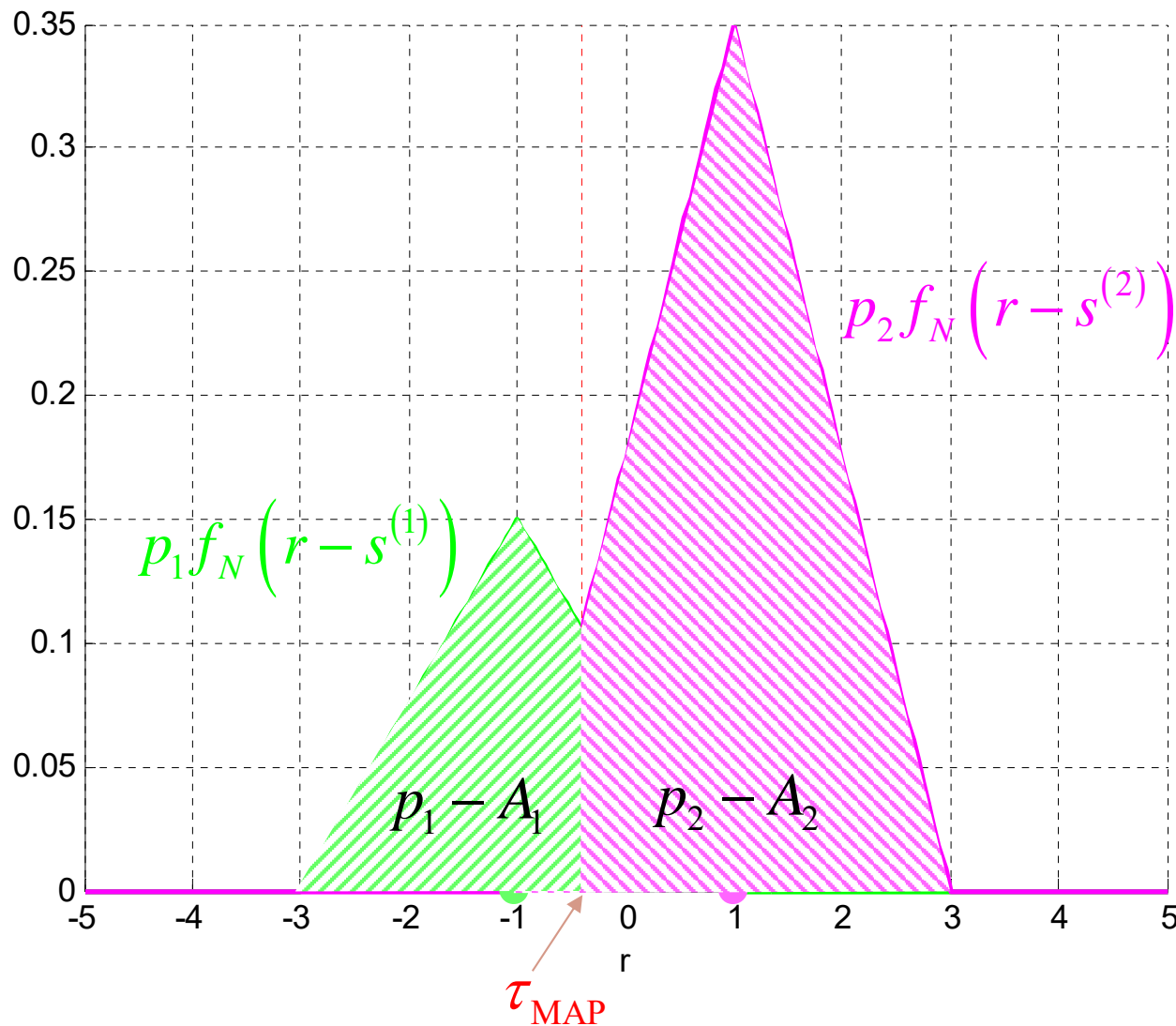
Error Probability

Ex. Binary PAM under “Triangular” Noise



Error Probability

Ex. Binary PAM under “Triangular” Noise



$$P(\mathcal{C}) = (p_1 - A_1) + (p_2 - A_2)$$

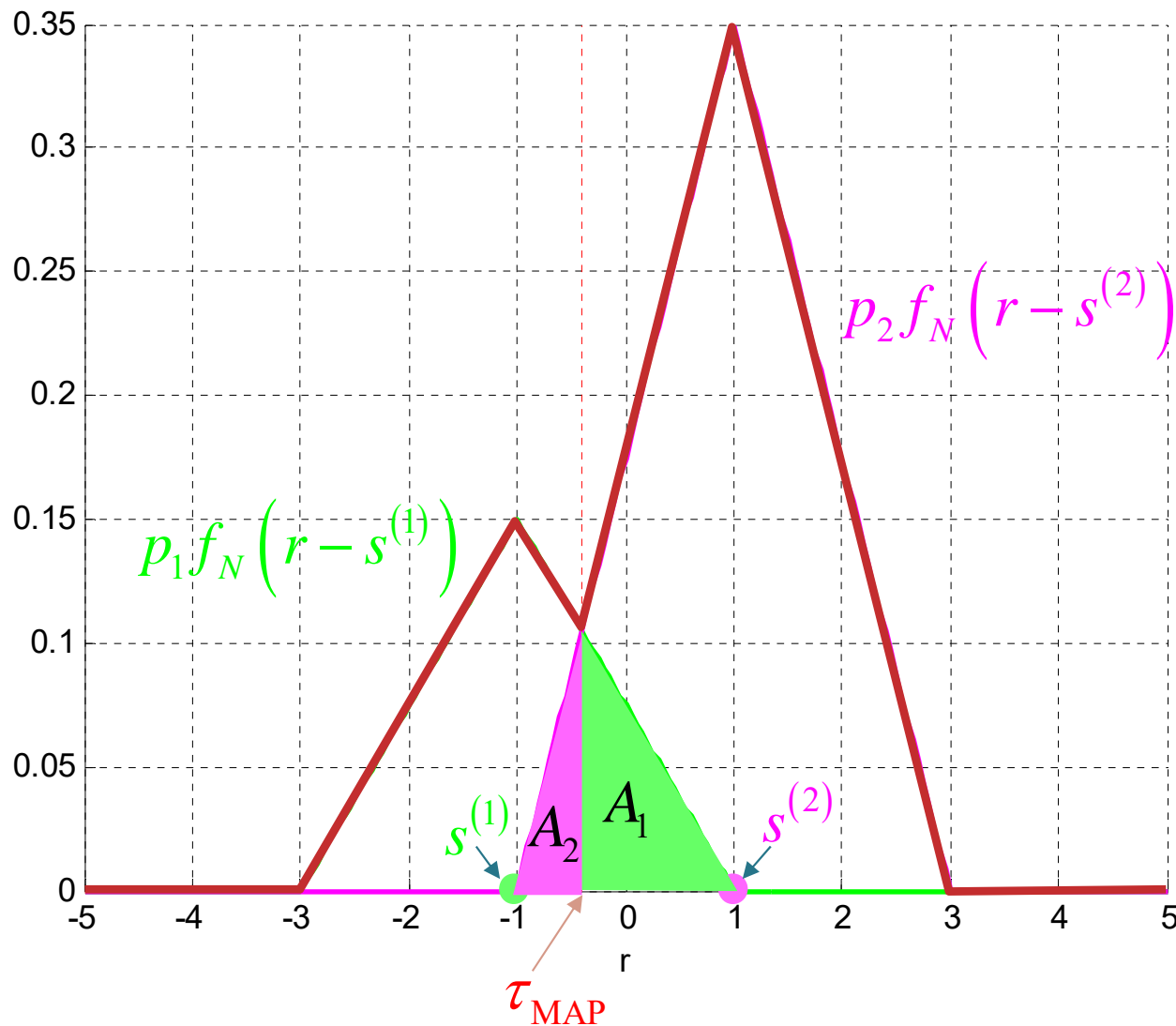
$$= 1 - (A_1 + A_2)$$

$$P(\mathcal{E}) = 1 - P(\mathcal{C})$$

$$= A_1 + A_2$$

Error Probability

Ex. Binary PAM under “Triangular” Noise



$$P(\mathcal{C}) = (p_1 - A_1) + (p_2 - A_2)$$

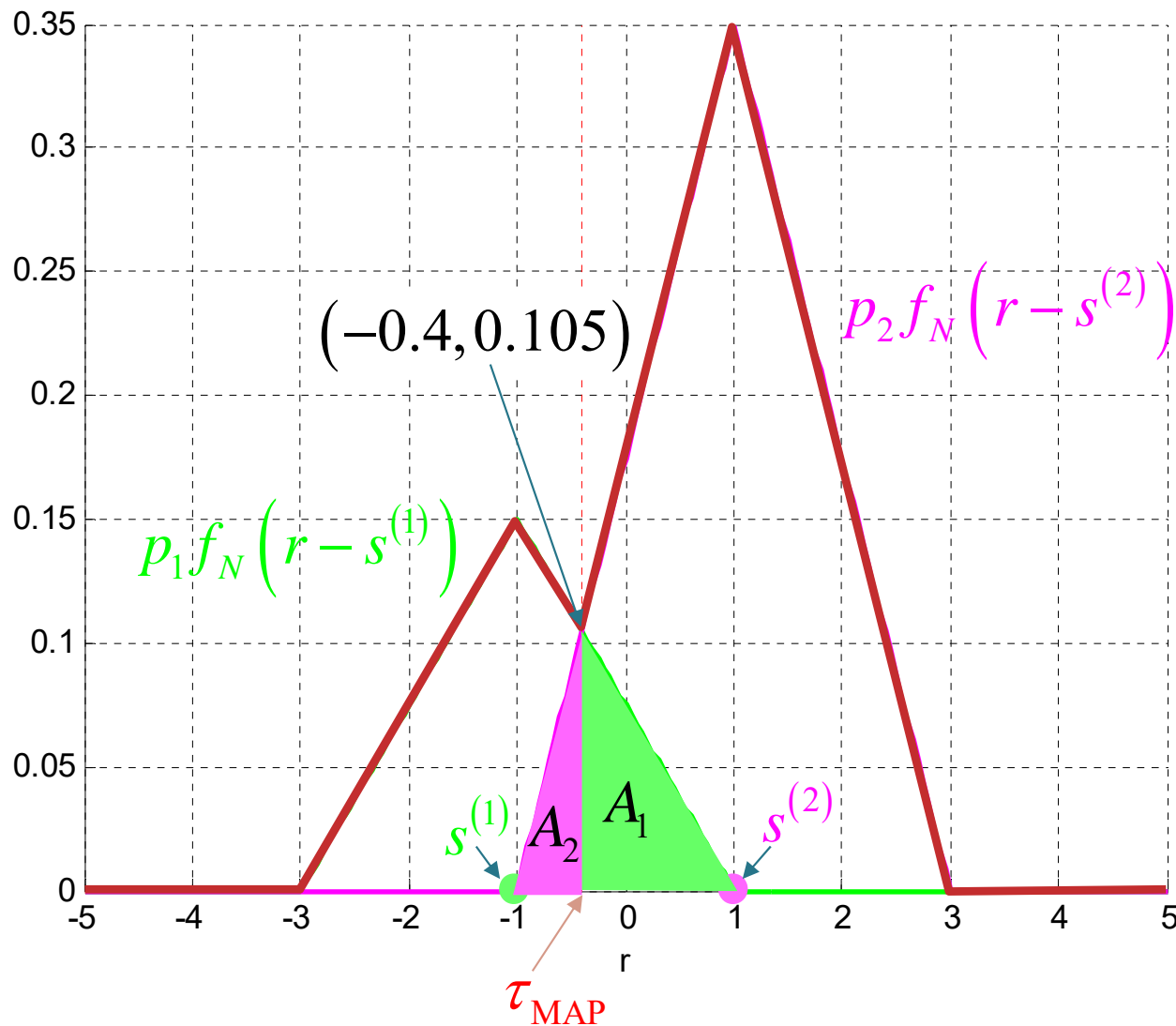
$$= 1 - (A_1 + A_2)$$

$$P(\mathcal{E}) = 1 - P(\mathcal{C})$$

$$= A_1 + A_2$$

Error Probability

Ex. Binary PAM under “Triangular” Noise



$$P(\mathcal{C}) = (p_1 - A_1) + (p_2 - A_2)$$

$$= 1 - (A_1 + A_2)$$

$$P(\mathcal{E}) = 1 - P(\mathcal{C})$$

$$= A_1 + A_2$$

$$\approx \frac{1}{2} \times 2 \times 0.105$$

$$= 0.105$$

