Information Theory: Principles and Applications
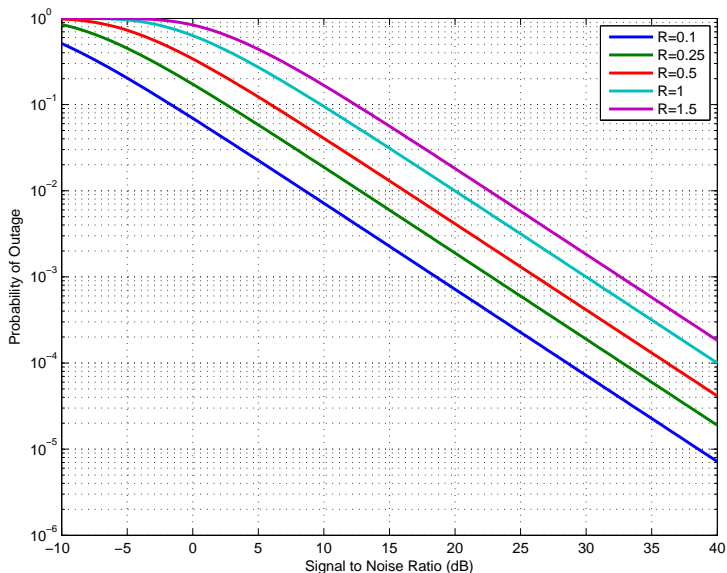
Tiago T. V. Vinhoza

June 4, 2010

Fading Channels

- Caused by multi-path effect: signal transmitted from a transmitter may have multiple copies traversing different paths to reach a receiver.
- The received signal should be the sum of all these multi-path signals.
- If signals are in phase, they would intensify the resultant signal; otherwise, the resultant signal is weakened due to out of phase.
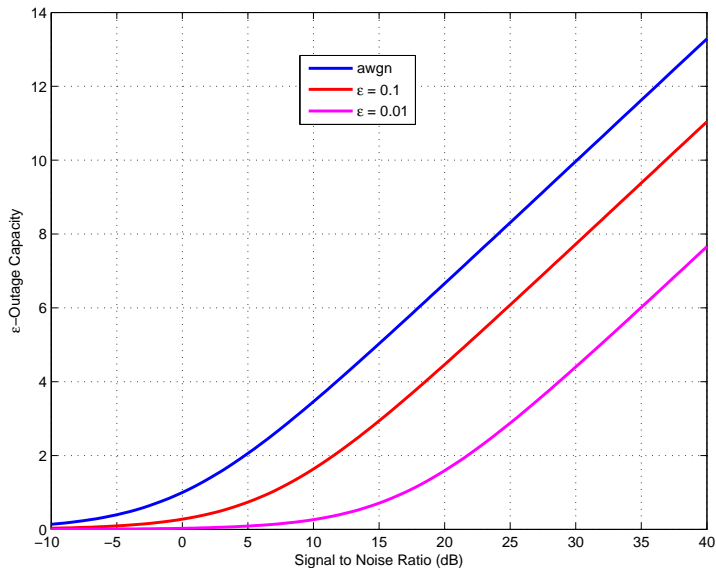- Often modelled as a random process: Rayleigh fading, Rician Fading.

Fading Channels
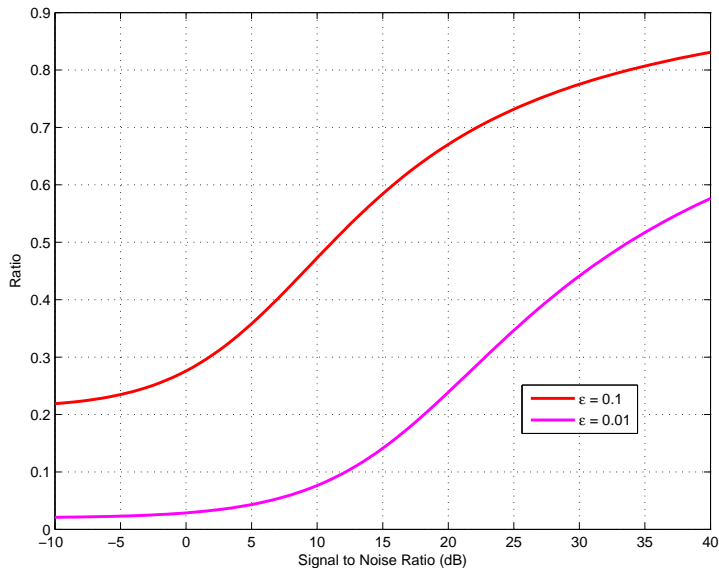
- Slow fading channel
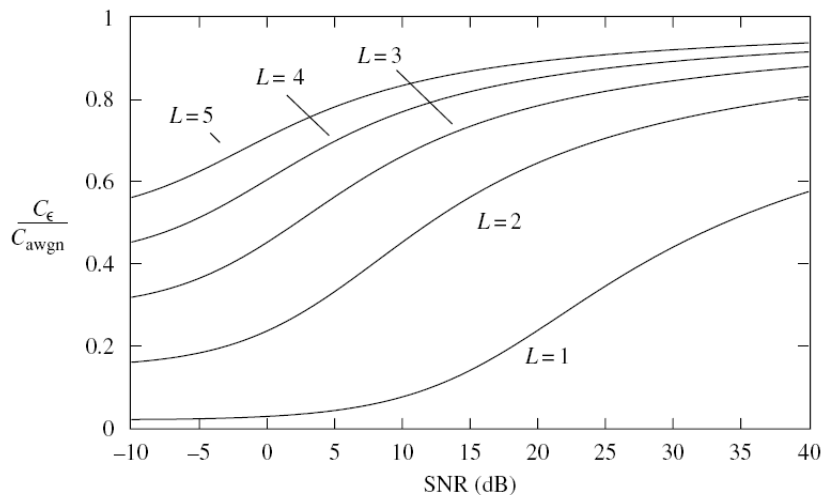- Fast Fading channel

Fading Channels: Outage Capacity
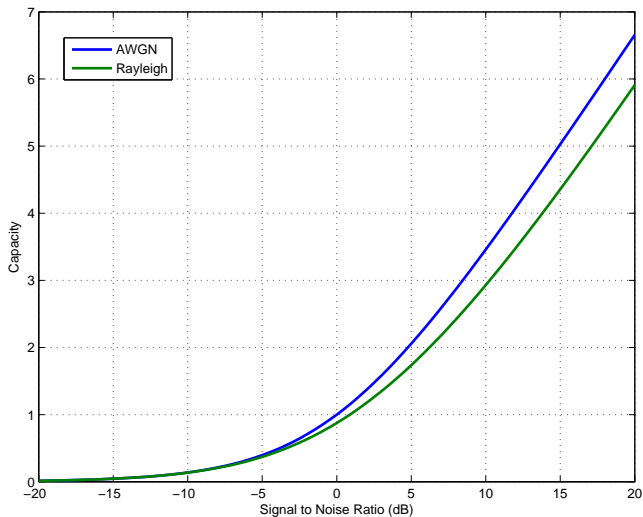
Fading Channels: ϵ-outage capacity

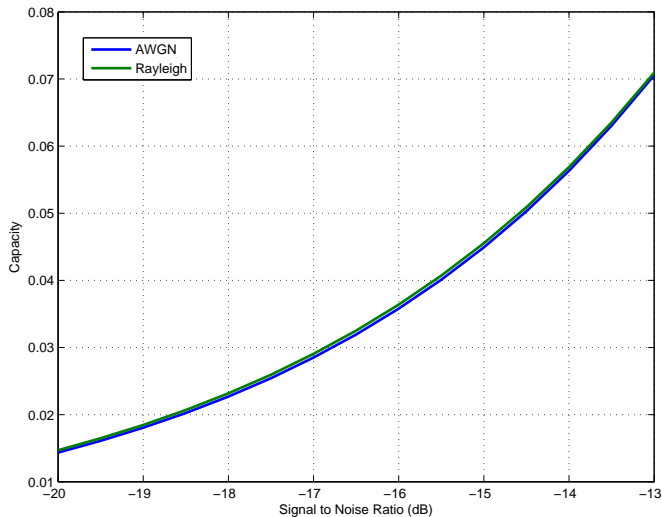# Fading Channels: ϵ-outage capacity

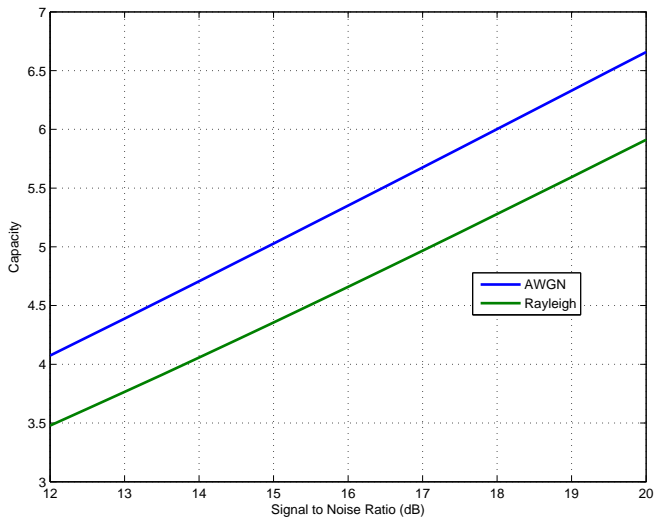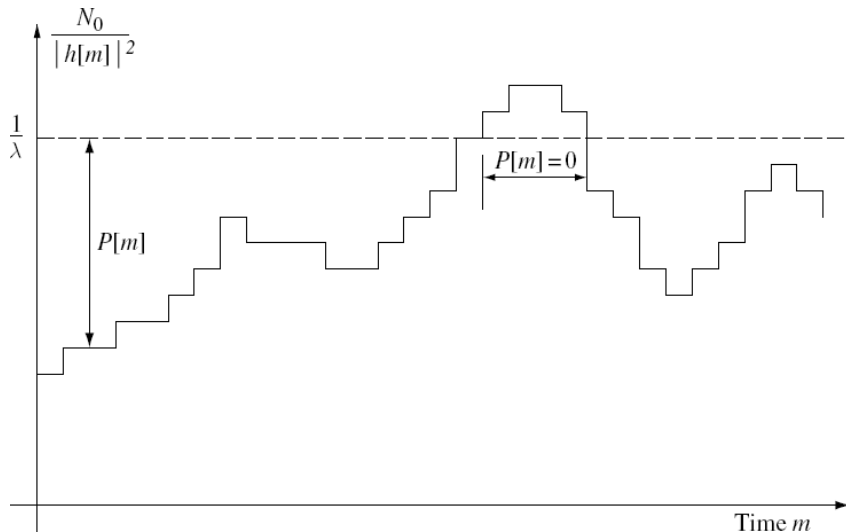# Fading Channels: Diversity works

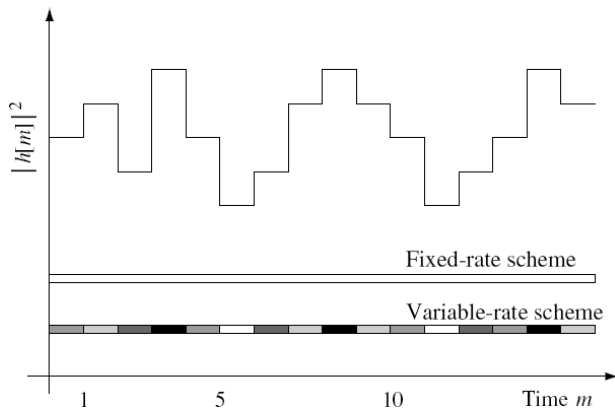# Fading Channels: AWGN vs Rayleigh

Fading Channels: AWGN vs Rayleigh

Fading Channels: AWGN vs Rayleigh

Fading Channels: Waterfilling

Fading Channels: Variable Rate Coding

Fading Channels: Channel Knowledge