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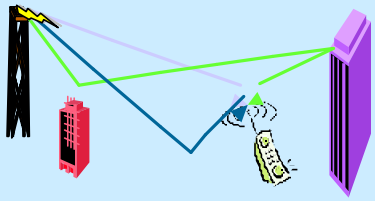
System Features

- Goals
  - To deploy two or more antennas at handsets to dynamically reconfigure the antenna beam
- Requirement: Low-power dissipation
- Benefits: Antenna gain and diversity gain

Space-Time Processing

- Signal impairments in wireless communications are due to intersymbol interference (ISI) and cochannel interference (CCI).



- Temporal signal processing reduces ISI using an equalizer or a rake receiver.
- Spatial signal processing reduces CCI using a smart antenna.

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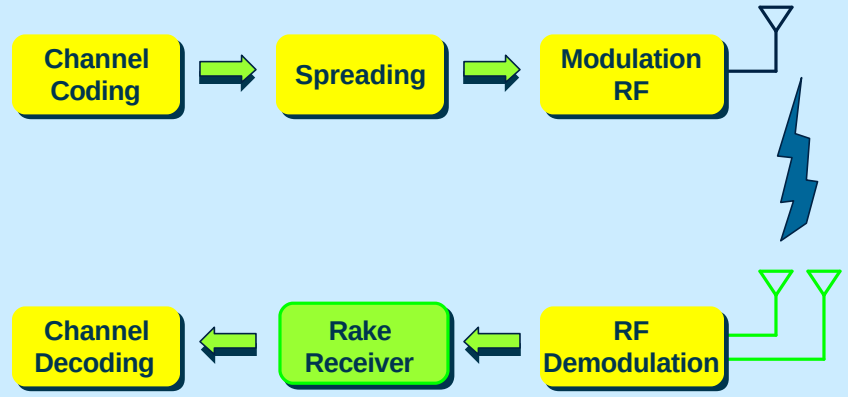
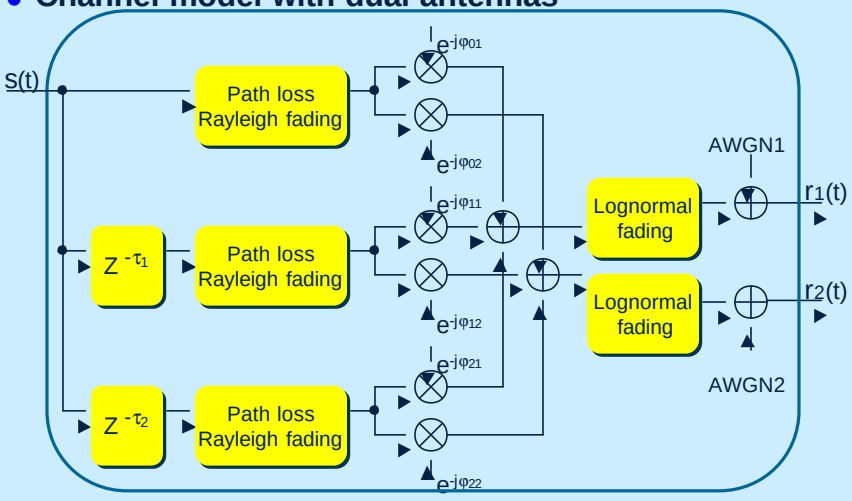
CDMA System with Smart Antenna

- Rake receiver in a handset processes the dual antenna signals.



Channel Model

- Channel model with dual antennas



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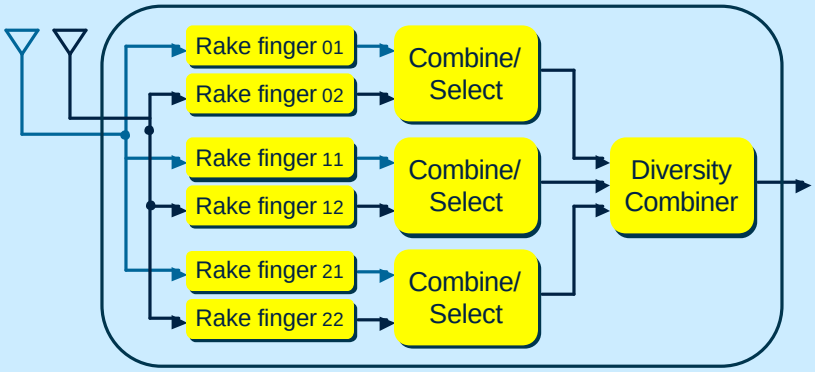
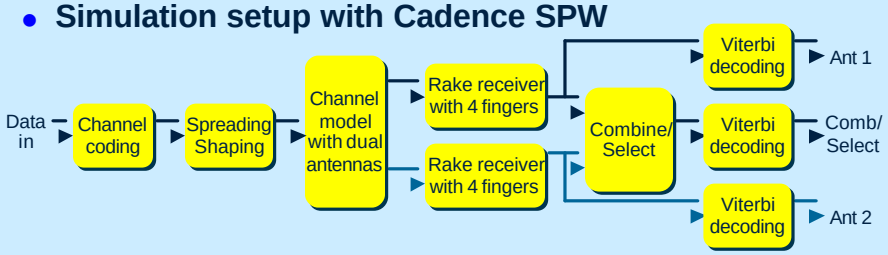
Rake Receiver Design

- Combining or selecting method can be used for the despreading signals.
- Proposed rake receiver block



Performance of Smart Antenna

- Simulation setup with Cadence SPW



- FER (frame error rate) with smart antenna