Robust Millimeter Wave Metropolitan Communication Links
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Overview
- Millimeter wave (70-90 GHz) LOS wireless link
- Goal: use for MANs (metropolitan area networks)
  - replacement for fiber MAN links (SONET, GbEthernet)
  - high bandwidth data links
  - backhaul for 3G cellular
- Rain fading severely attenuates signal
  - scattering and water absorption
  - precipitation intensity or droplet shape
- Result
  - severe degradation in throughput
  - link failure leading to network partition

Goals
- Understand feasibility of millimeter wave links
- Experiments to measure
  - correlation between precipitation and attenuation
  - validation against existing rain fade models
- Construct simulation model of the link
  - 3-state Markov model (strong, weak, disconnected)
  - input to mesh network simulations
    - see poster
      [Weather Disruption-Tolerant Wireless Gigabit Mesh Architecture]

Link Experiment Layout
- Two-hop frame throughput experiment
  - long hop under stress

Conceptual Results
- Correlation of errors to precipitation rate
  - radio packet error rate [packets/s]
  - precipitation depth [inches/time-interval]