

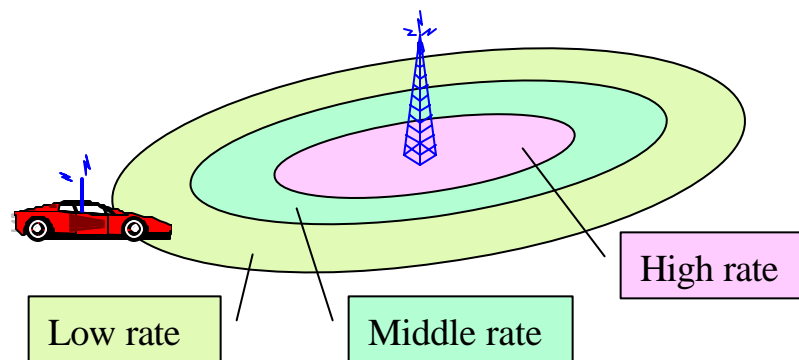
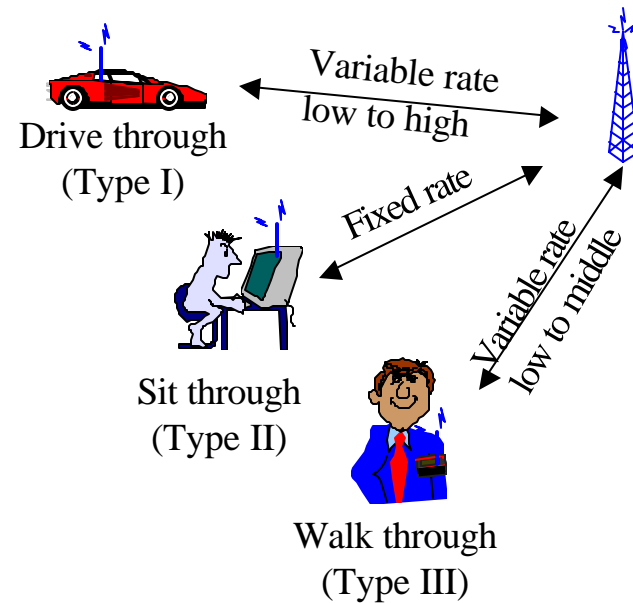
INFOSTATIONS: *WINMAC* RESEARCH

Prof. James G. Evans

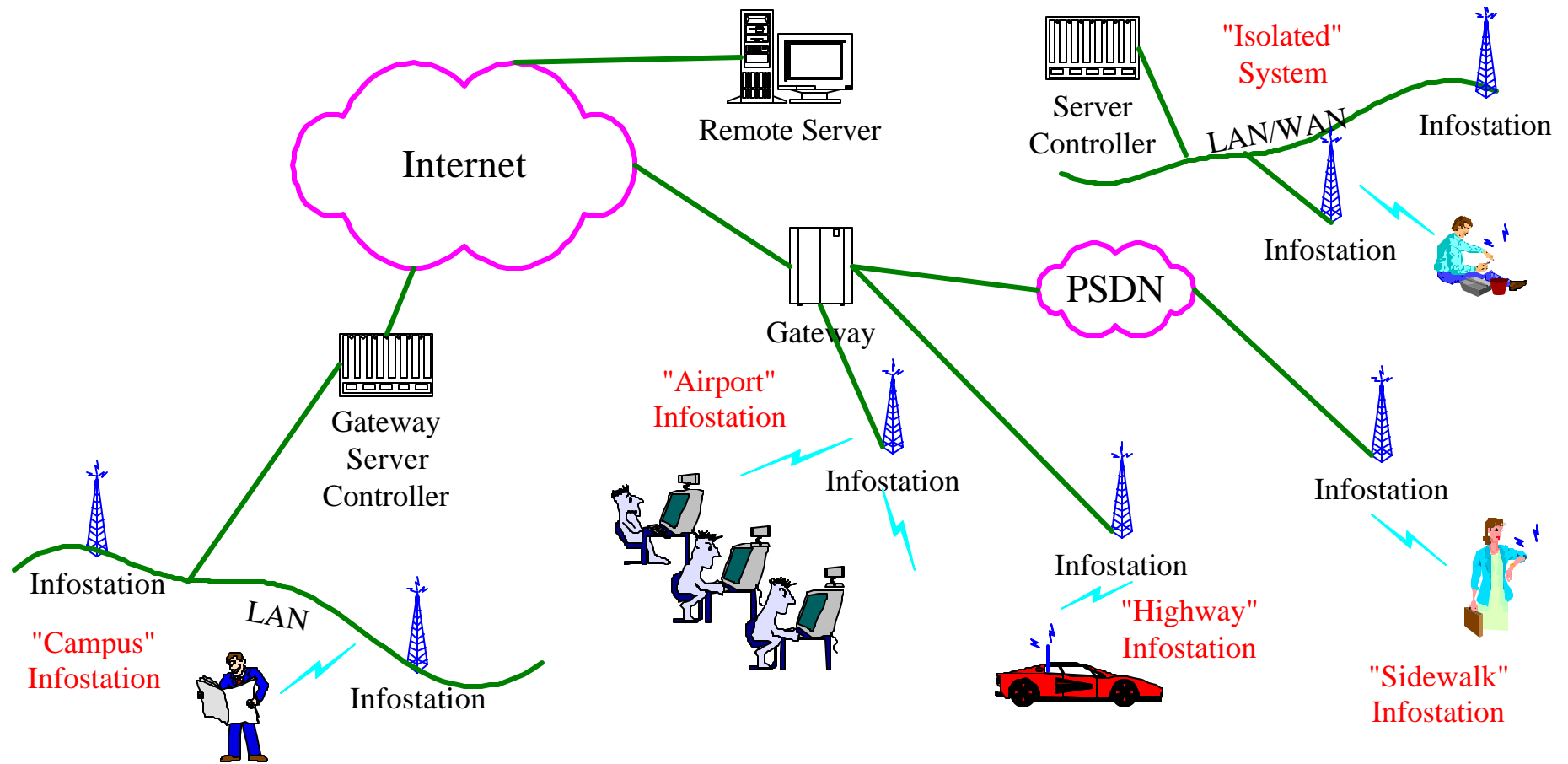
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INFOSTATIONS: many-time, many-where

- Infostation scenarios
 - Drive through
 - Sit through
 - Walk through
- Different types of terminals
 - cost, power supply, mobility, etc.
- Transmission rates
 - Fixed and variable
 - Relationship between coverage area and rate



INFOSTATION: system architecture



ATTRIBUTES OF WINMAC

- MASTER(INFOSTATION) + SLAVE(MOBILES) ARCHITECTURE *FOR LESS COMPLEX AND LIGHTER MOBILE TERMINALS*
- INTERNET COMPATIBLE (TCP/IP NETWORK) ARCHITECTURE
- MULTI USER WITH PRIORITIZED ALLOCATION OF CAPACITY
- DOWN LINK DATA RATES OF 0.25 - 4 MBPS [0.25 - 2 MBPS EXP. HARDWARE]
- UP LINK DATA RATES OF 10 KBPS - 4 MBPS [0.25 - 2 MBPS EXP. HARDWARE]
FOR SMALL BATTERY TO FULL FEATURED MOBILE TERMINALS
- DATA RATE SWITCHING AND LINK LAYER RETRANSMISSION ADAPTS TO CHANNEL CONDITION AND MOBILE CAPABILITIES
- TDD FRAME STRUCTURE *FOR ASYMMETRIC TRANSMISSION AND EFFICIENCY AND TO MINIMIZED CONTENTION*
- DOWN LINK BEACONS *FOR FAST ACQUISITION AND CHANNEL MONITORING*

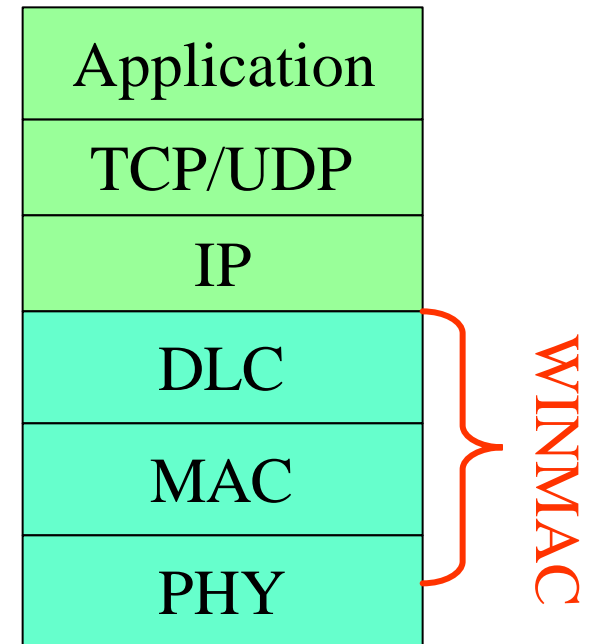
WINMAC: an intelligent transmission protocol for Infostations

- What is WINMAC?

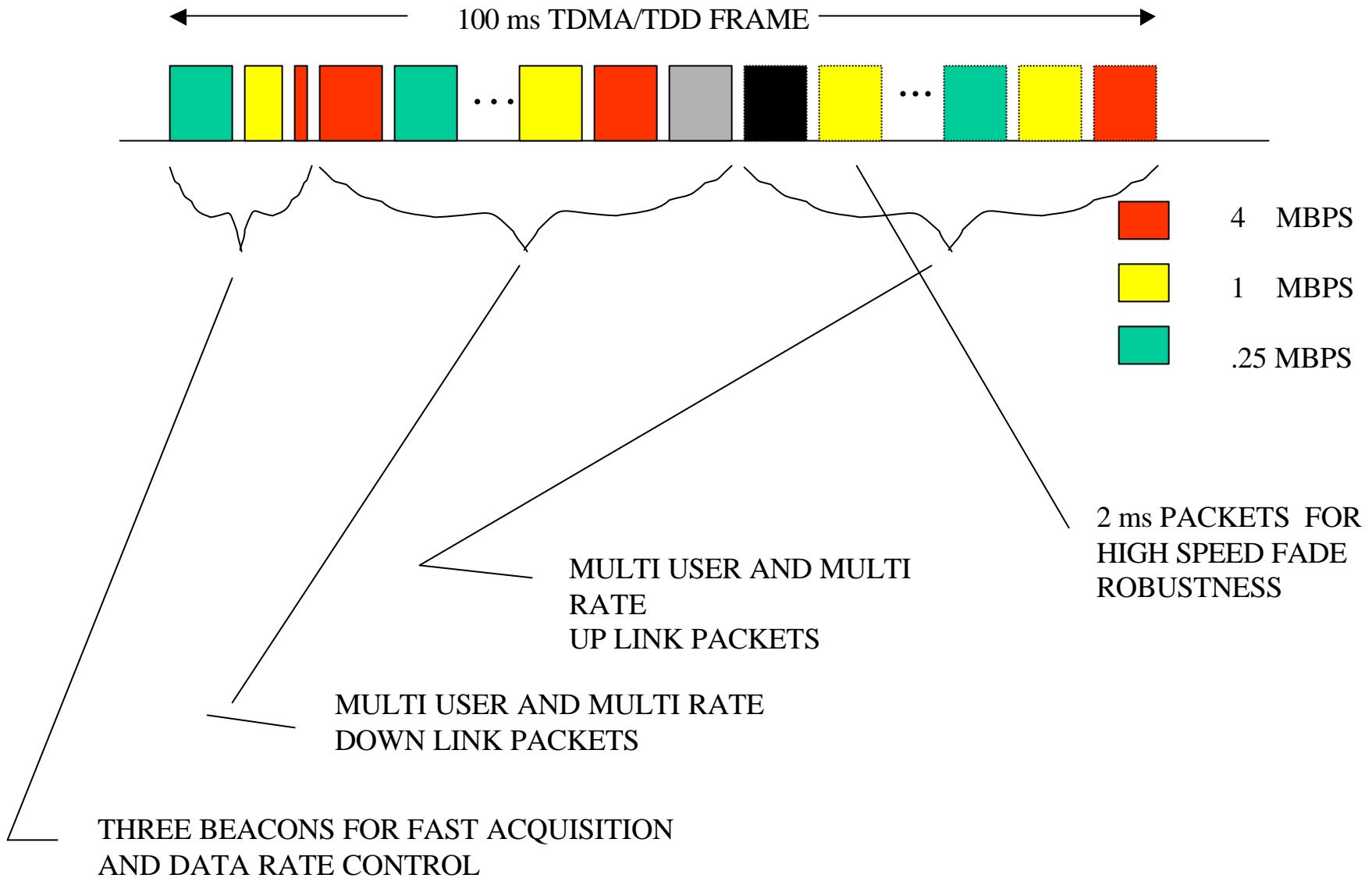
- Location in Internet protocol stack

- Radio link control layer
- Wireless MAC layer
- Part of wireless physical layer

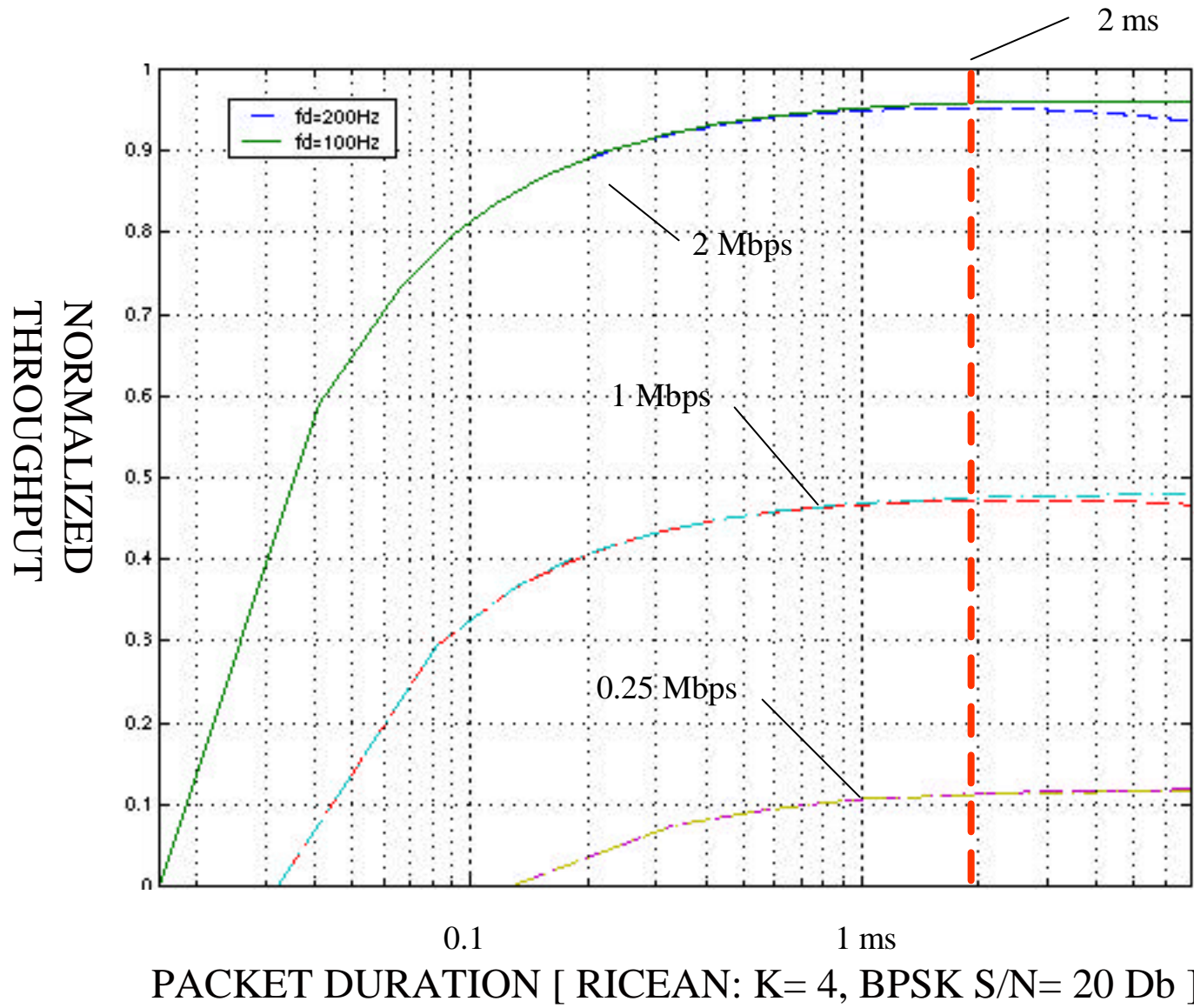
- Definition: an intelligent transmission protocol which can handle channel access and allocation, retransmission, and adaptive transmission rate adjustment for an Infostation.



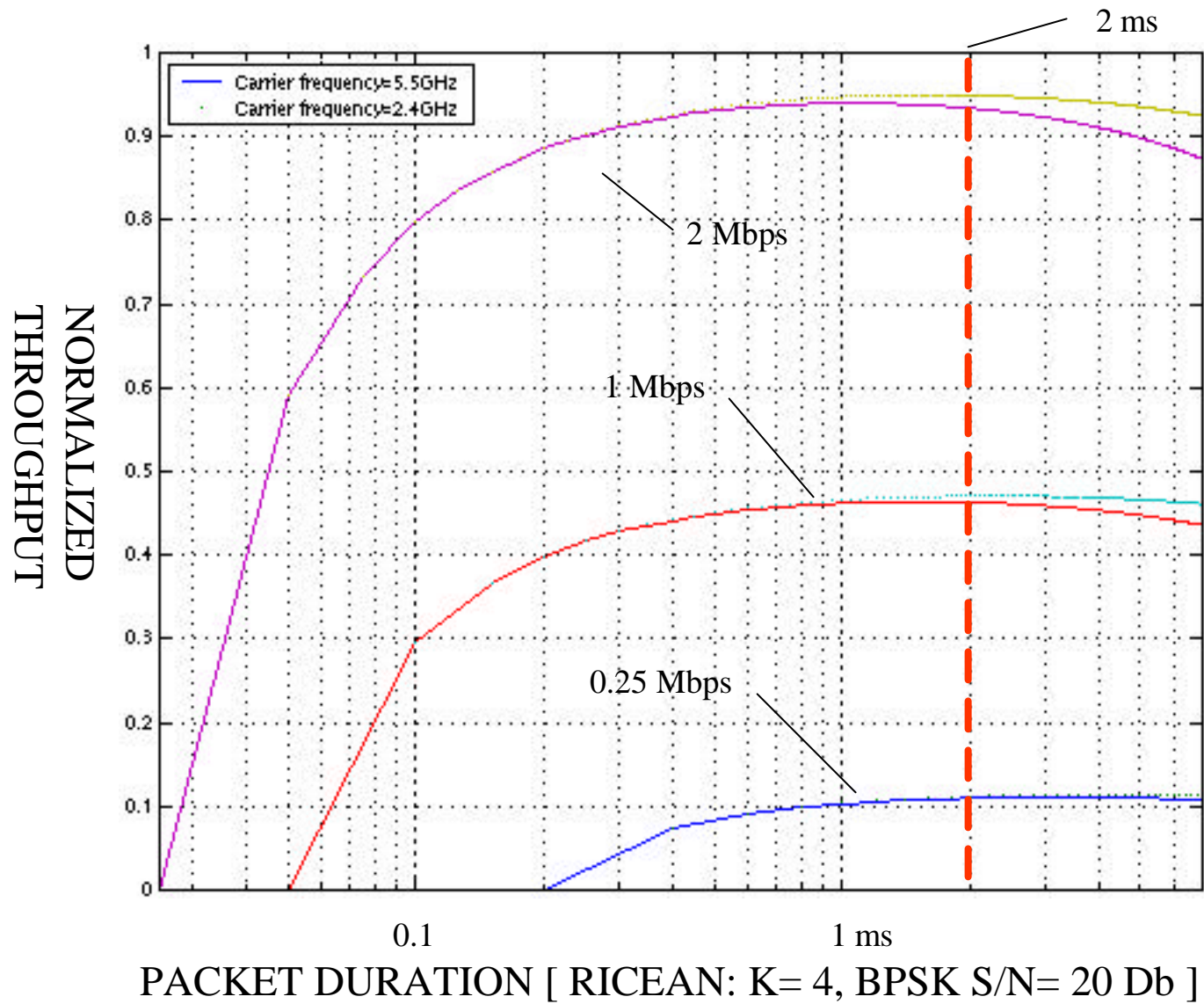
WINMAC FRAME STRUCTURE (DOWN LINK)



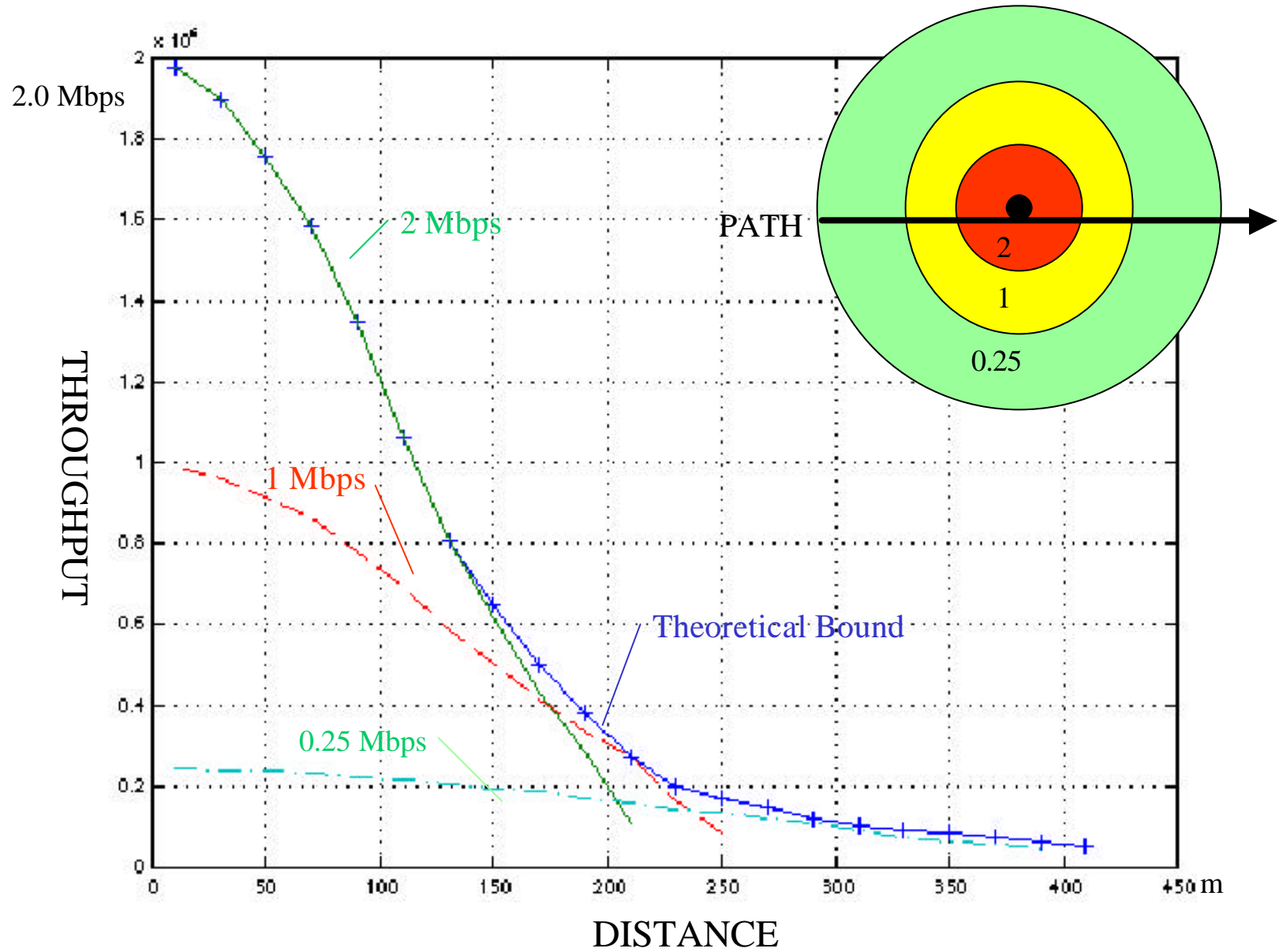
THROUGHPUT vs. PACKET DURATION vs. DOPPLER



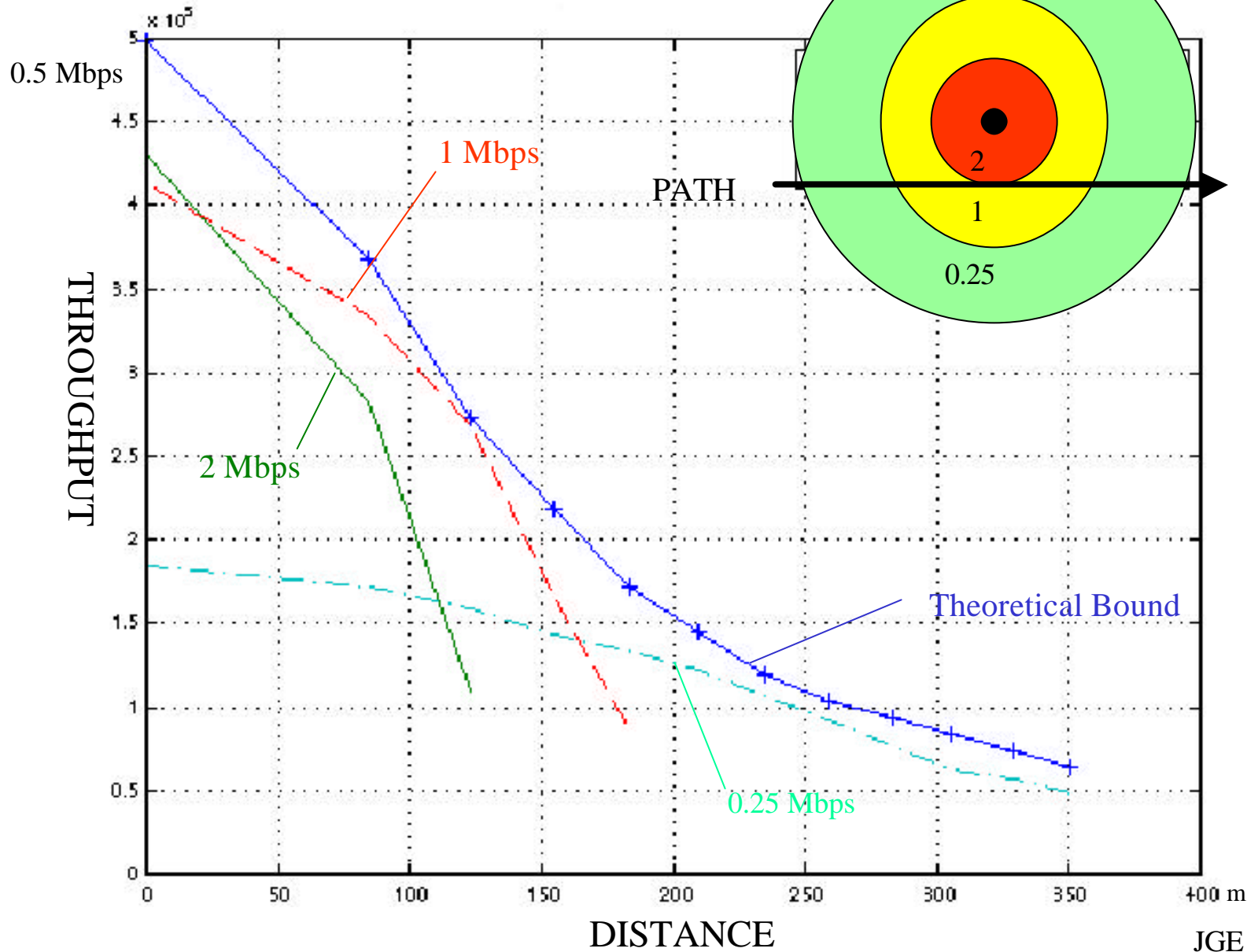
THROUGHPUT vs. PACKET DURATION vs. FREQUENCY



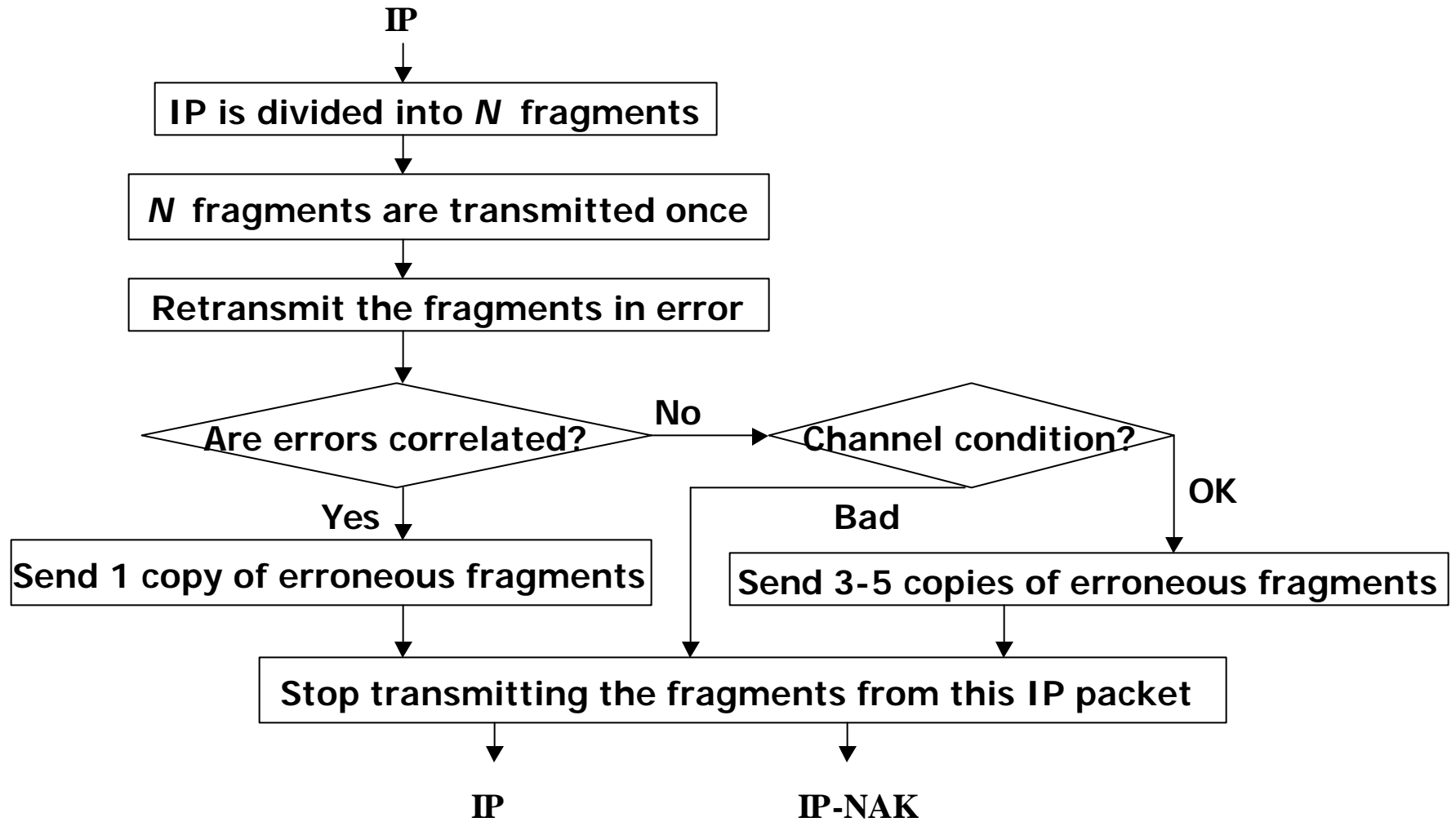
THROUGHPUT vs. DISTANCE



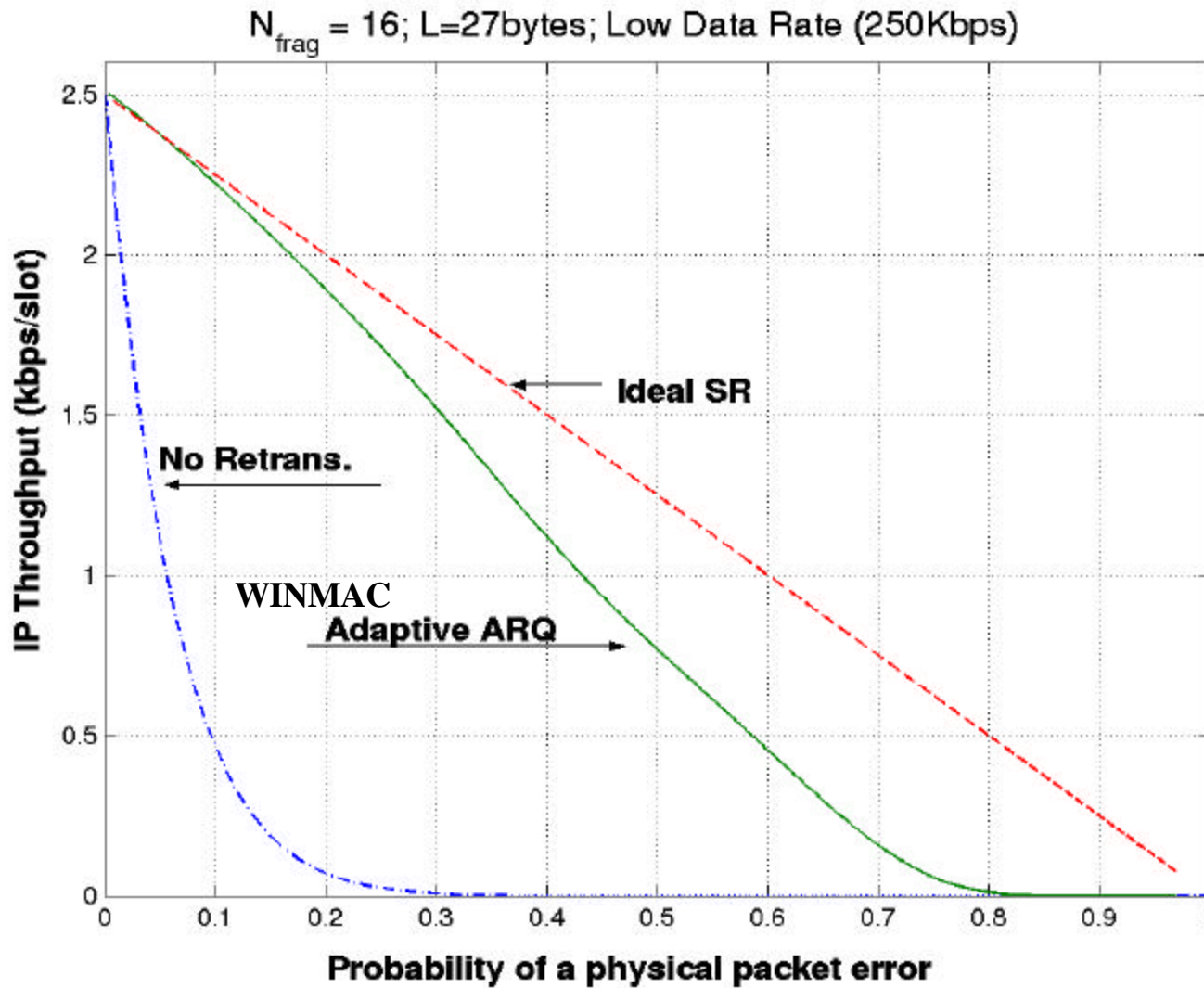
THROUGHPUT vs. DISTANCE



WINMAC RETRANSMISSION ALGORITHM



WINMAC RETRANSMISSION ALGORITHM THROUGHPUT vs. RADIO PACKET ERROR PROBABILITY



WINMAC RETRANSMISSION ALGORITHM EFFICIENCY vs. PROBABILITY OF A BIT ERROR

