

Coexistence-Aware Scheduling for LTE and WLAN During Hard In-Device Interference

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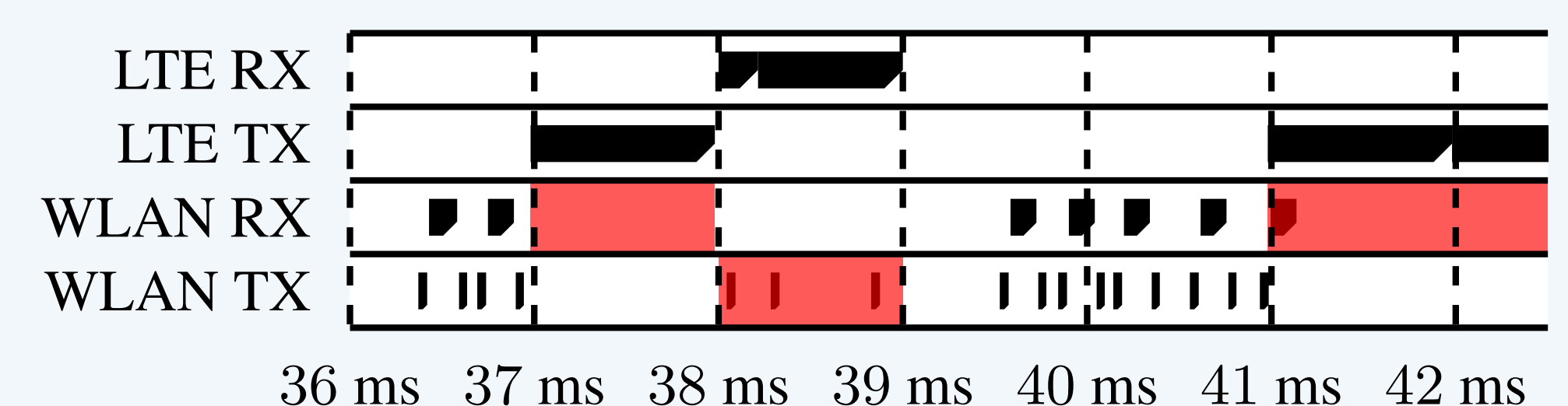
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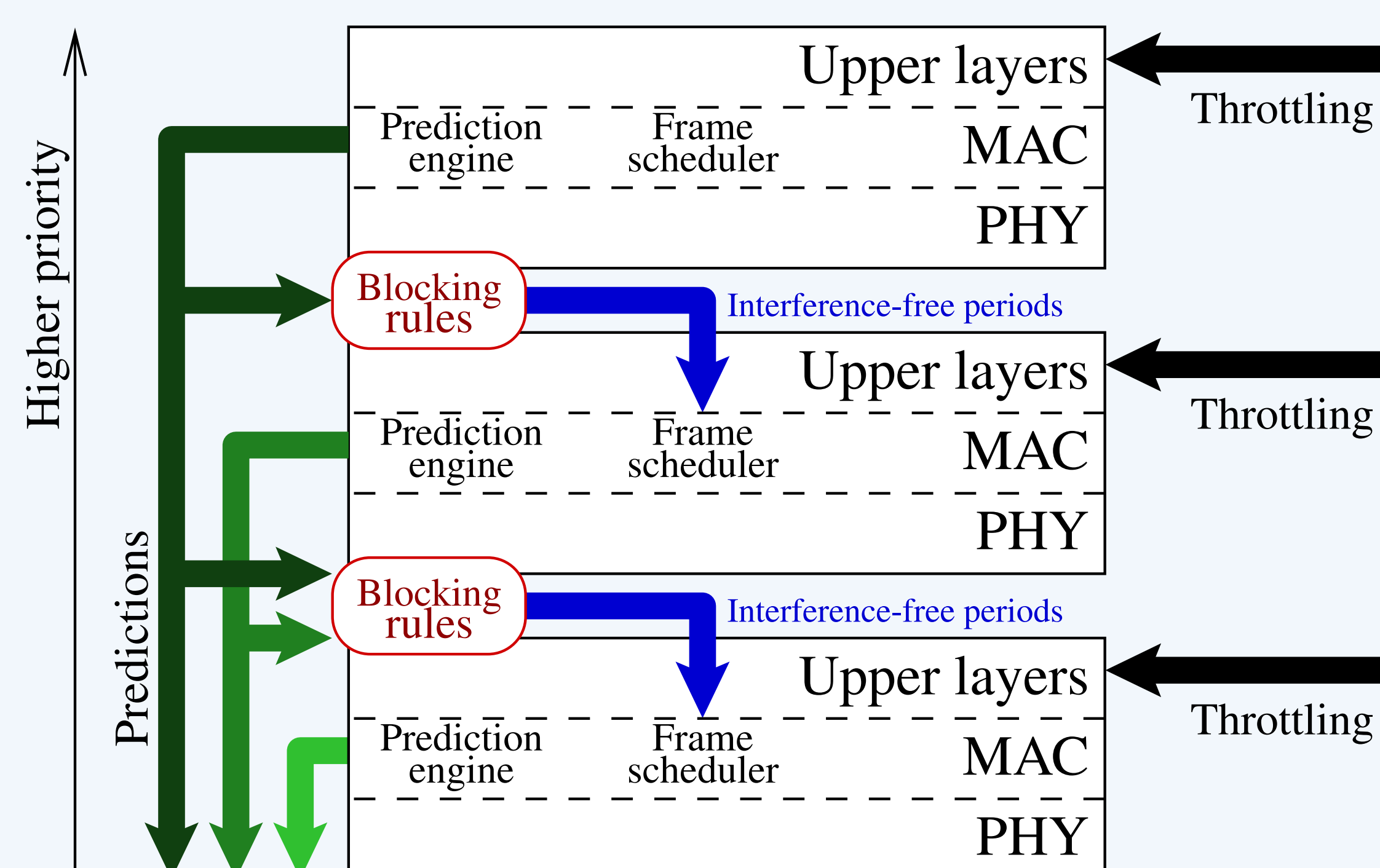
The Problem

- Put LTE and WLAN radios into a small package, *e.g.*, a smart phone, and there will be severe inter-radio TX→RX interference
- Problematic band combinations: WLAN 2.4 GHz, LTE bands: 7 (TX 2500–2570 MHz), 40 (TDD 2300–2400 MHz), 41 (TDD 2496–2690 MHz)
- In-device coexistence standardization effort in progress (3GPP TR 36.816)



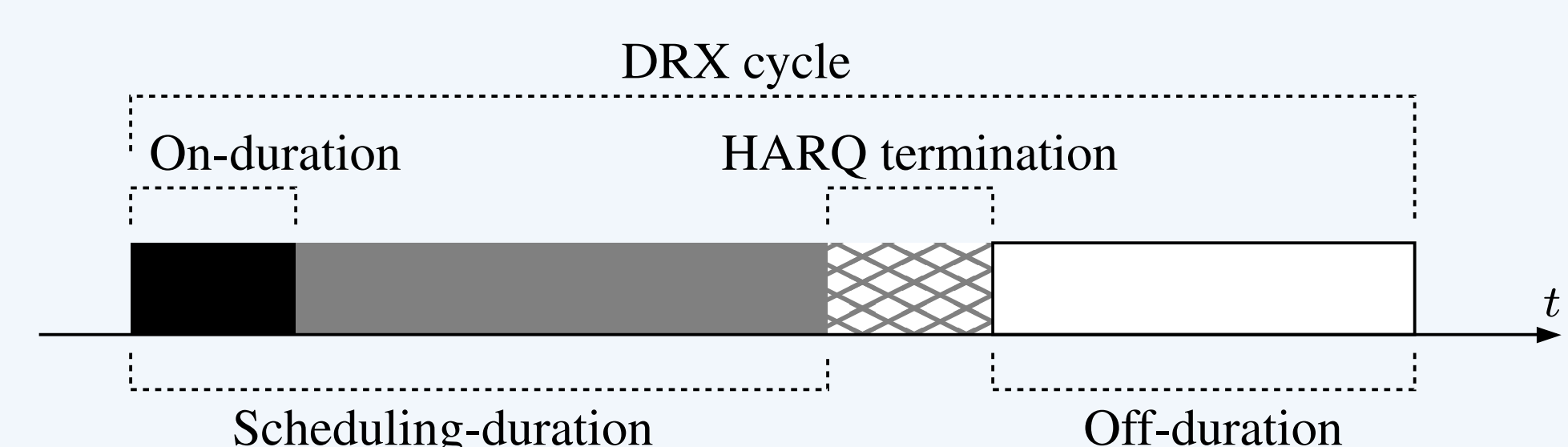
WLAN RX desensitized by LTE TX; WLAN TX prevented by LTE RX

Coexistence Scheduling



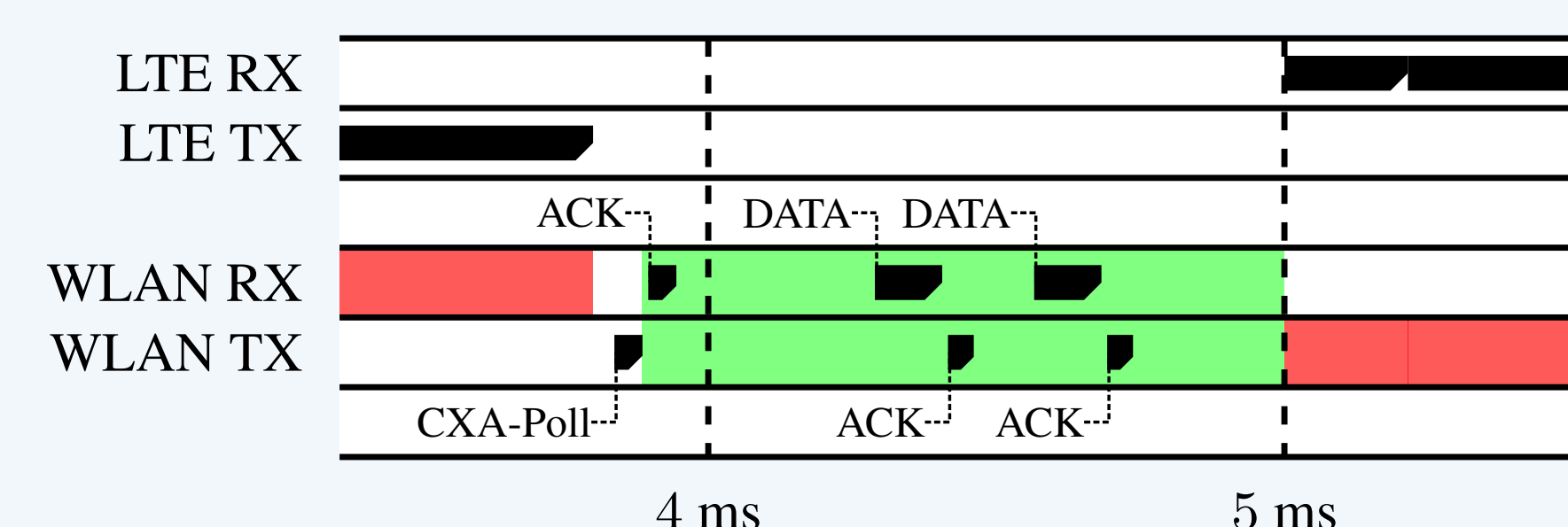
- Predict communications at higher priority (LTE)
- Adjust to interference-free periods at lower priority (WLAN)
- Throttle at higher priority to guarantee interference-free periods
- Balance by, *e.g.*, data transfer pressures

LTE DRX Scheduling Duration



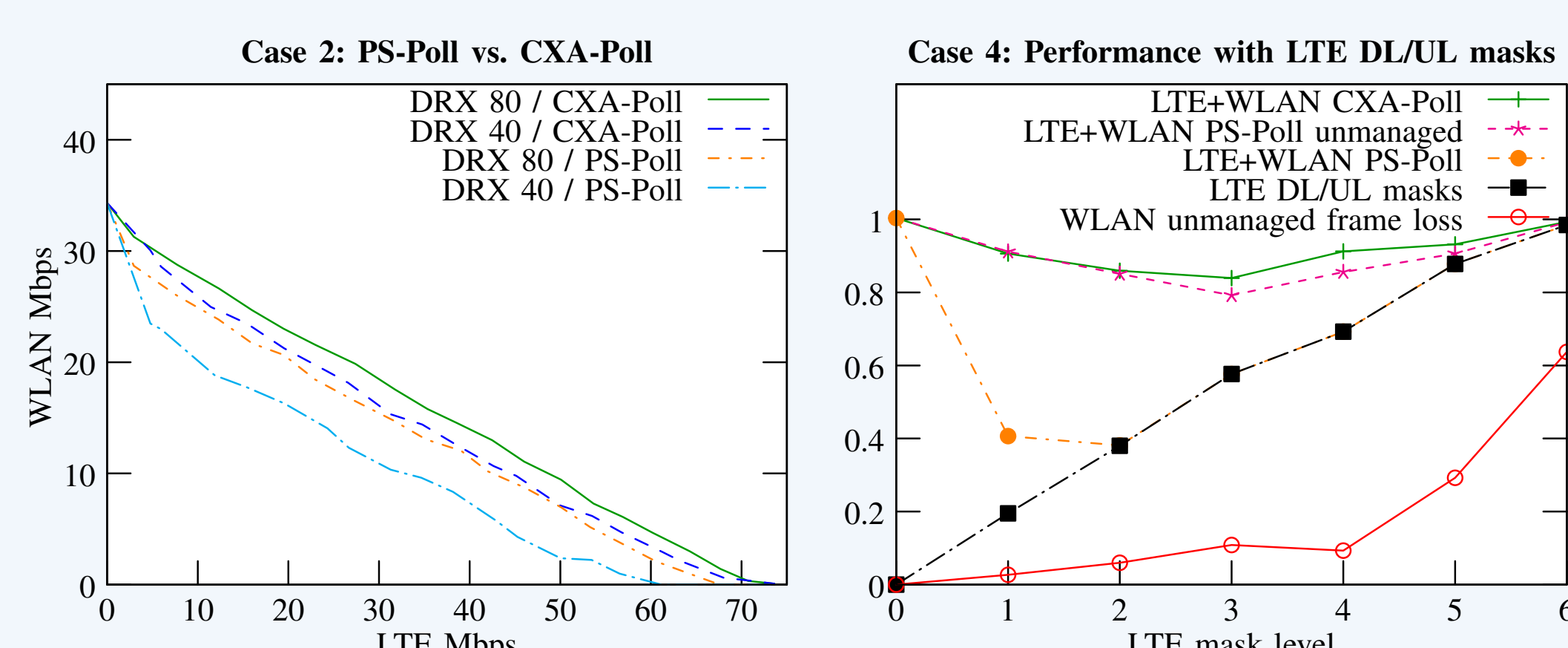
- Proposed mechanism for throttling
- Extends standard DRX
- Specifies a duty cycle for new HARQ transmissions

WLAN CXA-Poll



- Proposed mechanism for adjusting to interference-free periods
- Extends standard U-APSD with a deadline

Simulation Results



- LTE DRX SD and WLAN CXA-Poll alone are sufficient for IDC
- But best results are achieved with combined use