Spearix UNTETHERED™

Test Report White Paper:

Effects of Microwave Ovens on Narrowband Wireless in 2.4GHz Spectrum

Tested using IEEE802.15.4 Physical Layer

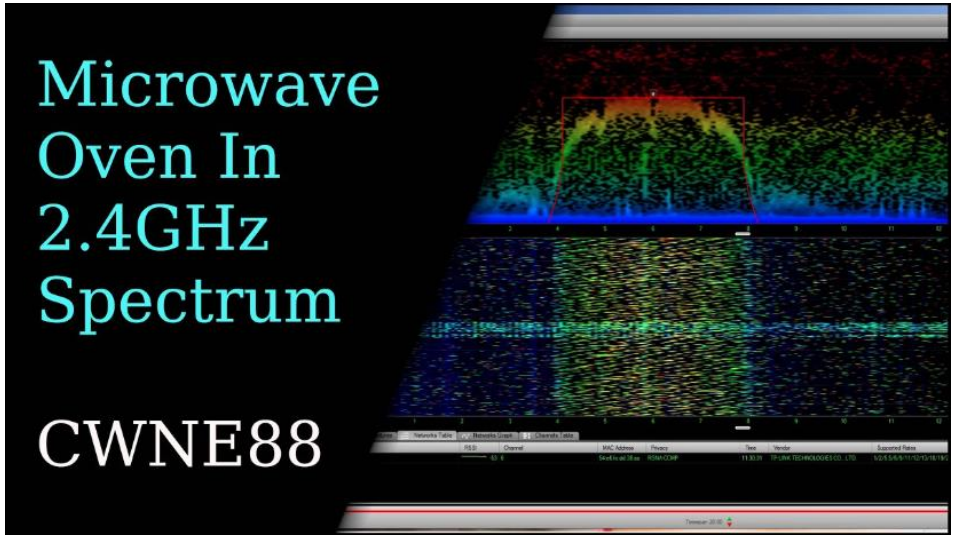
5/6/2024

SPX210C4 Response Near Microwave Oven

- Goal to test effects of microwave oven emissions on SPX210C4 evaluation kit wireless access point
- Access point 6ft from microwave oven
- Oven set to 100% power

Microwave Ovens Emit 2.4GHz Broadband

- Microwave ovens emit broadband 2.4GHz as high as –50dBm power detected 6ft away
- Presents disruptive interference to any wireless operating in 2.4GHz ISM band
- Wireless sensitivity is generally below –90dBm, meaning typical microwave oven emissions may present 10,000X higher power relative to typical wireless signals



Video source: https://www.youtube.com/watch?v=6N3P842Nay8

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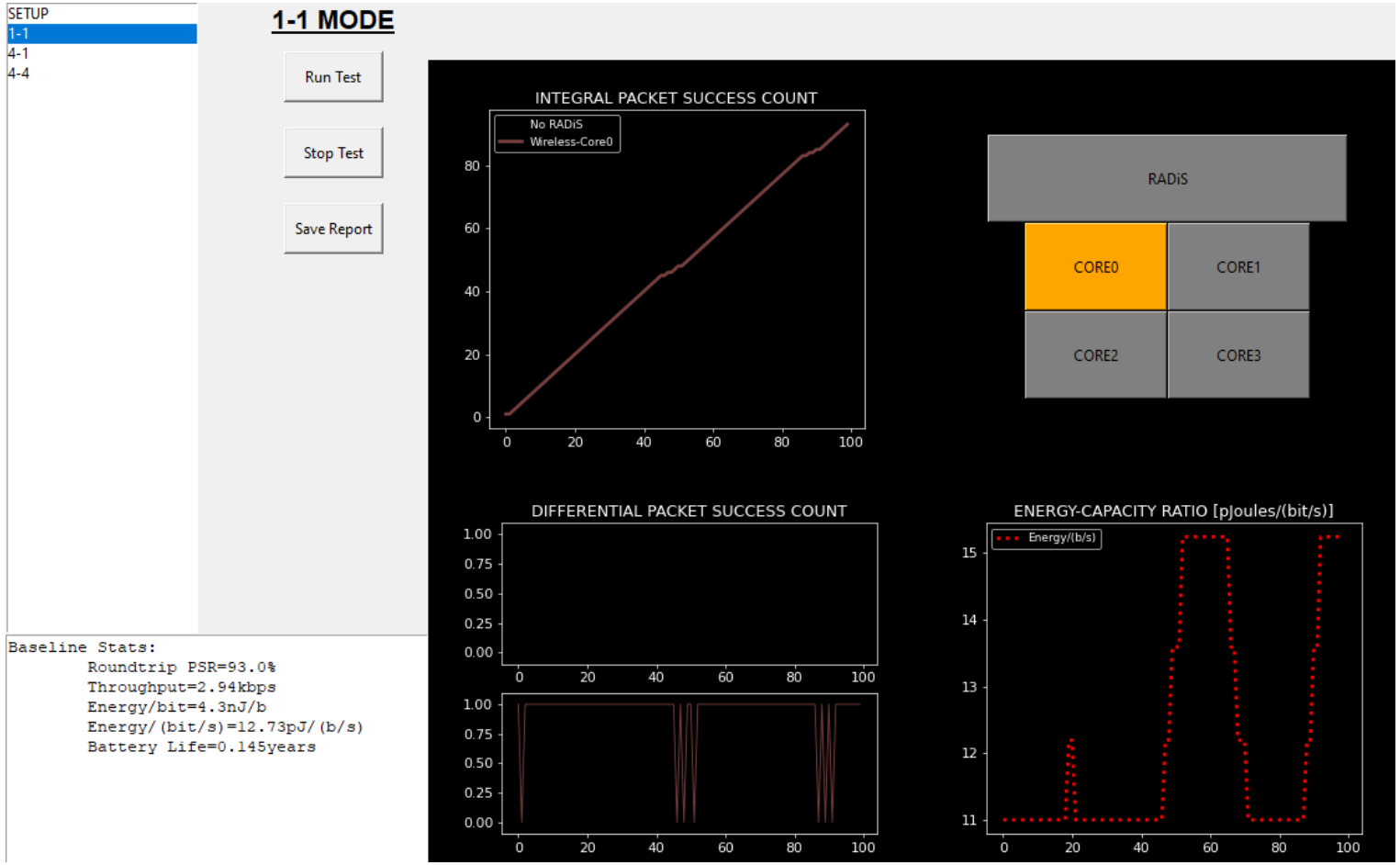
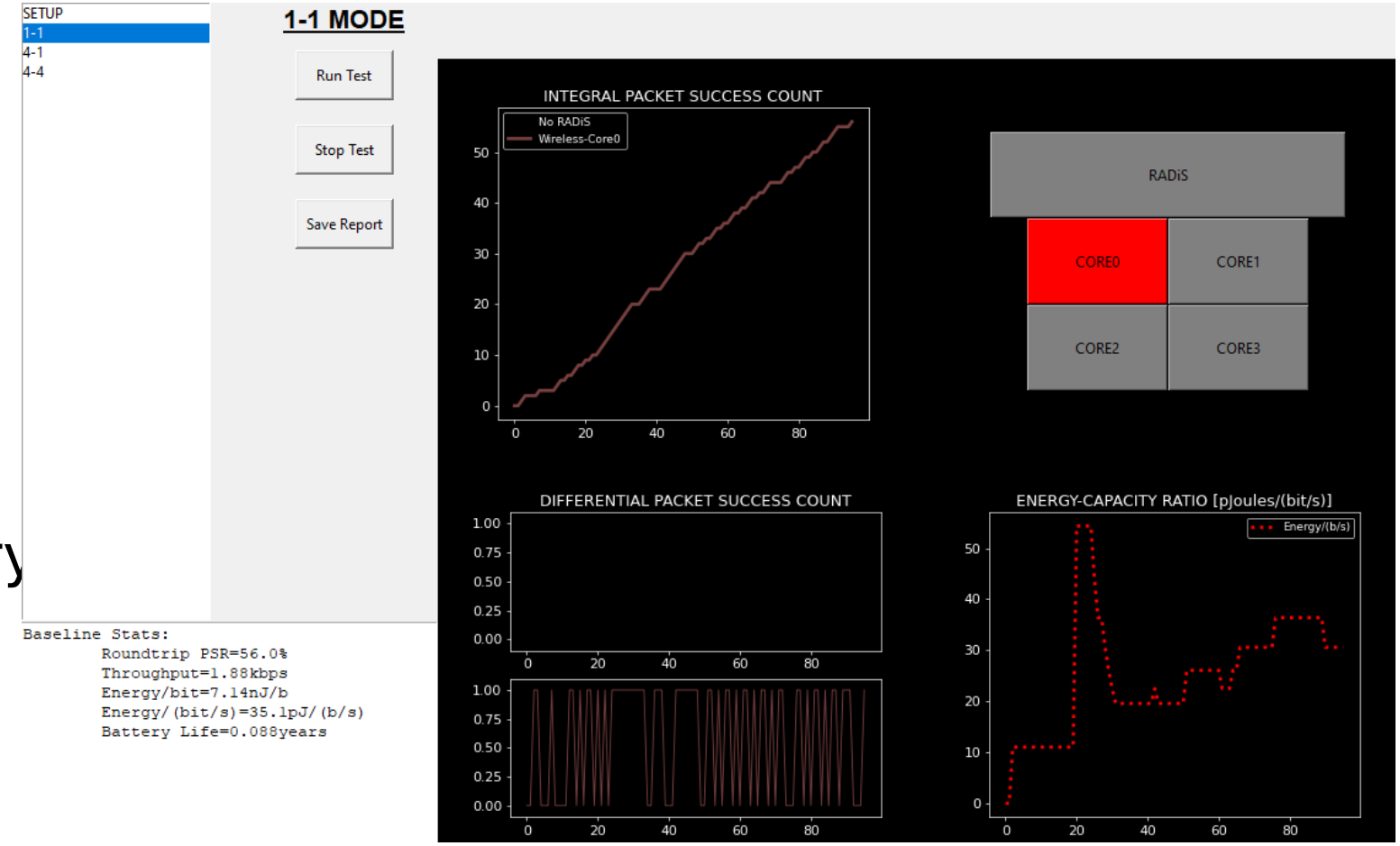
First Test 1 to 1 Baseline—Looks Good!

- Baseline using single core with microwave oven off: 93% packet success rate



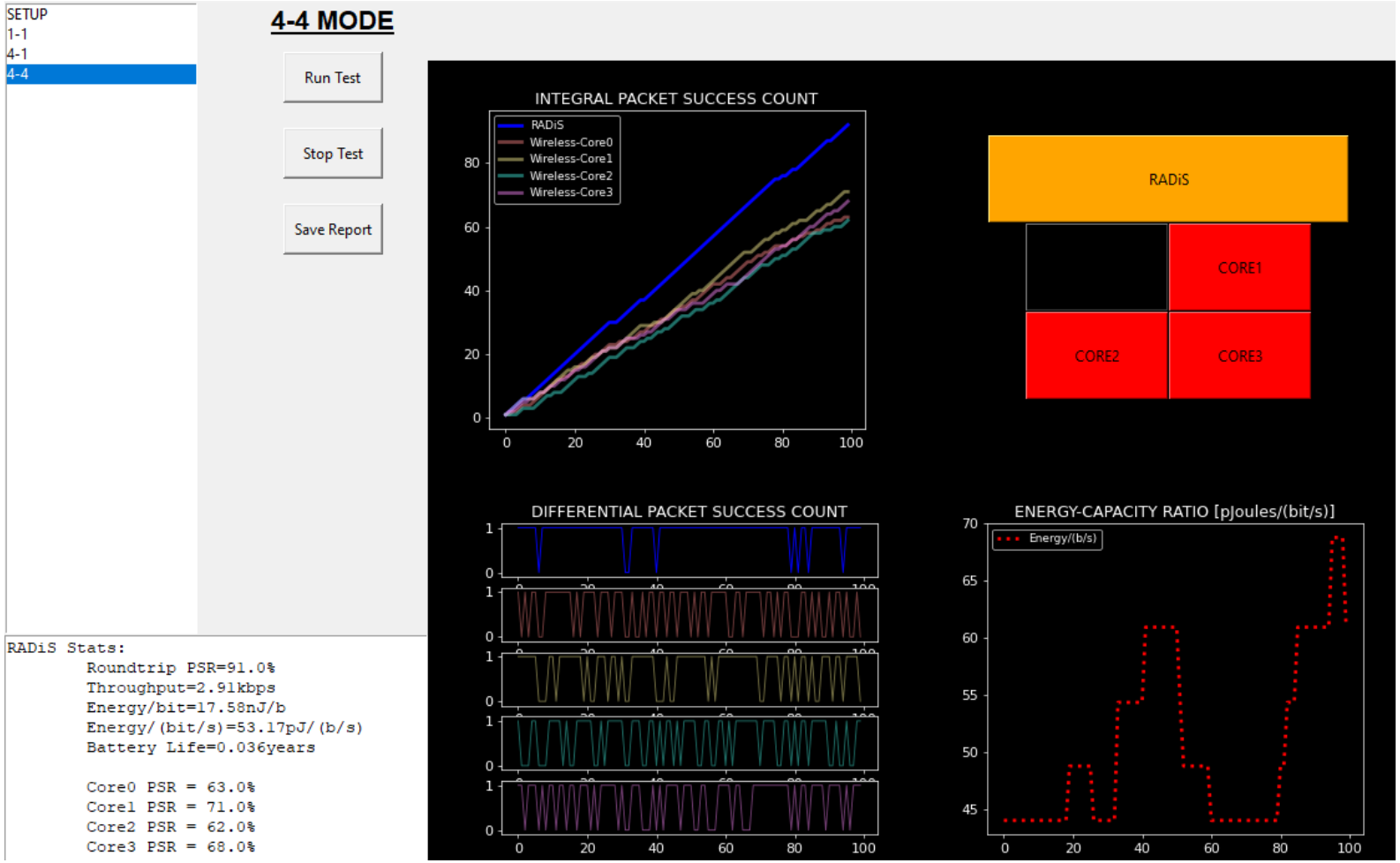
Microwave On: Reliability Falls to 56% PSR

- In the presence of microwave oven emissions, wireless operating in 2.4GHz quickly falls in reliability
- Leads to lower battery life, excessive retransmissions and uncontrolled latency



RADiS™ 4 to 4 Mode Solves the Problem: 91%

- Diversity achieved with 4 to 4 mode RADiS™ Mult-core cuts through microwave oven interference and recovers PSR, battery life and improves network total cost of ownership



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Thank you

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