



# Measurement Pathologies

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# What is a Measurement Pathology?

One needs to employ good measurement practices, which in mobile environments are tougher due to:

- The complex electromagnetic environment
- Coupling of intentional emissions (in-band and adjacent band) from other systems in the measurement vehicle
- Non-linear effects due to amplifiers in the transmitting and receiving systems

...our demo

## Case Studies

- Impact of adjacent-channel interference on sliding correlator measurements in Salt-Lake City at 1702 MHz
- Impact of in-band spurious signals on sliding correlator calibration at 3500 MHz at Table Mountain
- What could happen if we want to perform multiple frequency measurements to save time on a measurement campaign?

# Salt Lake City Measurements at 1.7 and 3.5 GHz





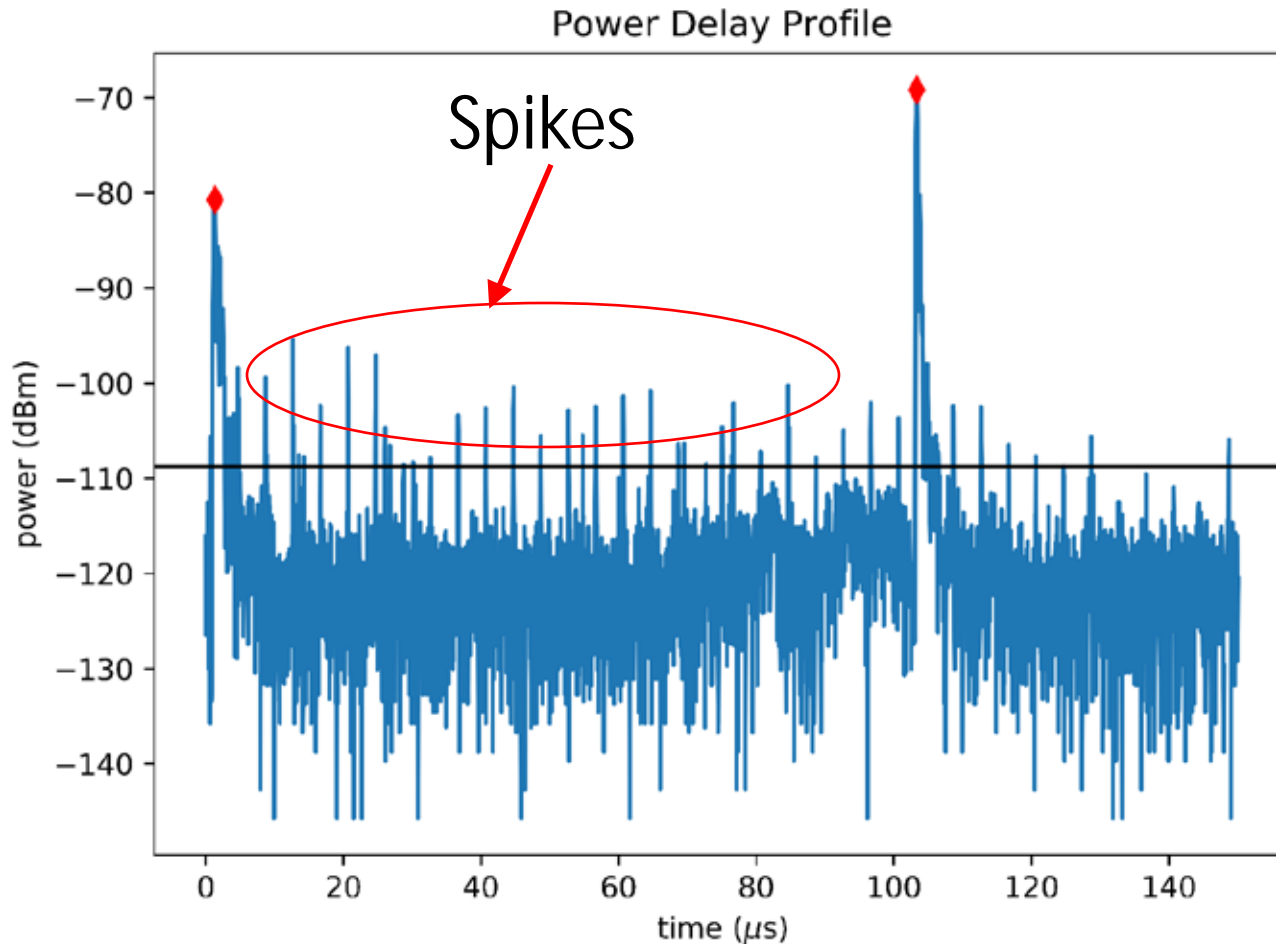
# Adjacent-Channel Interference at 1711 MHz



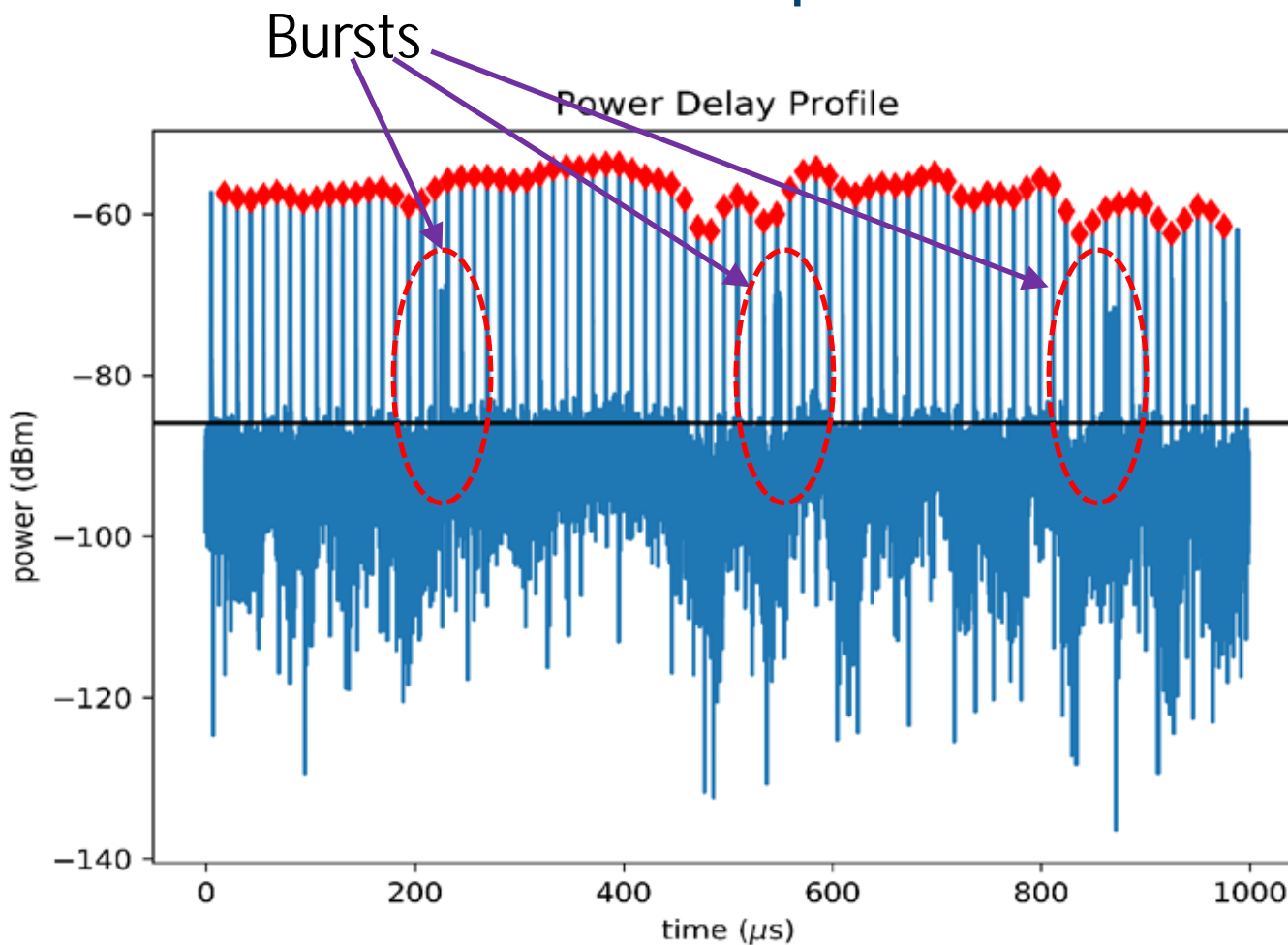
# Combined SC and Interference



# Impact on Sliding Correlator output 9-bit PN Sequence



# Impact on Sliding Correlator Output 6-bit PN Sequence



# Calibrations at Table Mountain



# Automated Cals with Stepped Attenuator

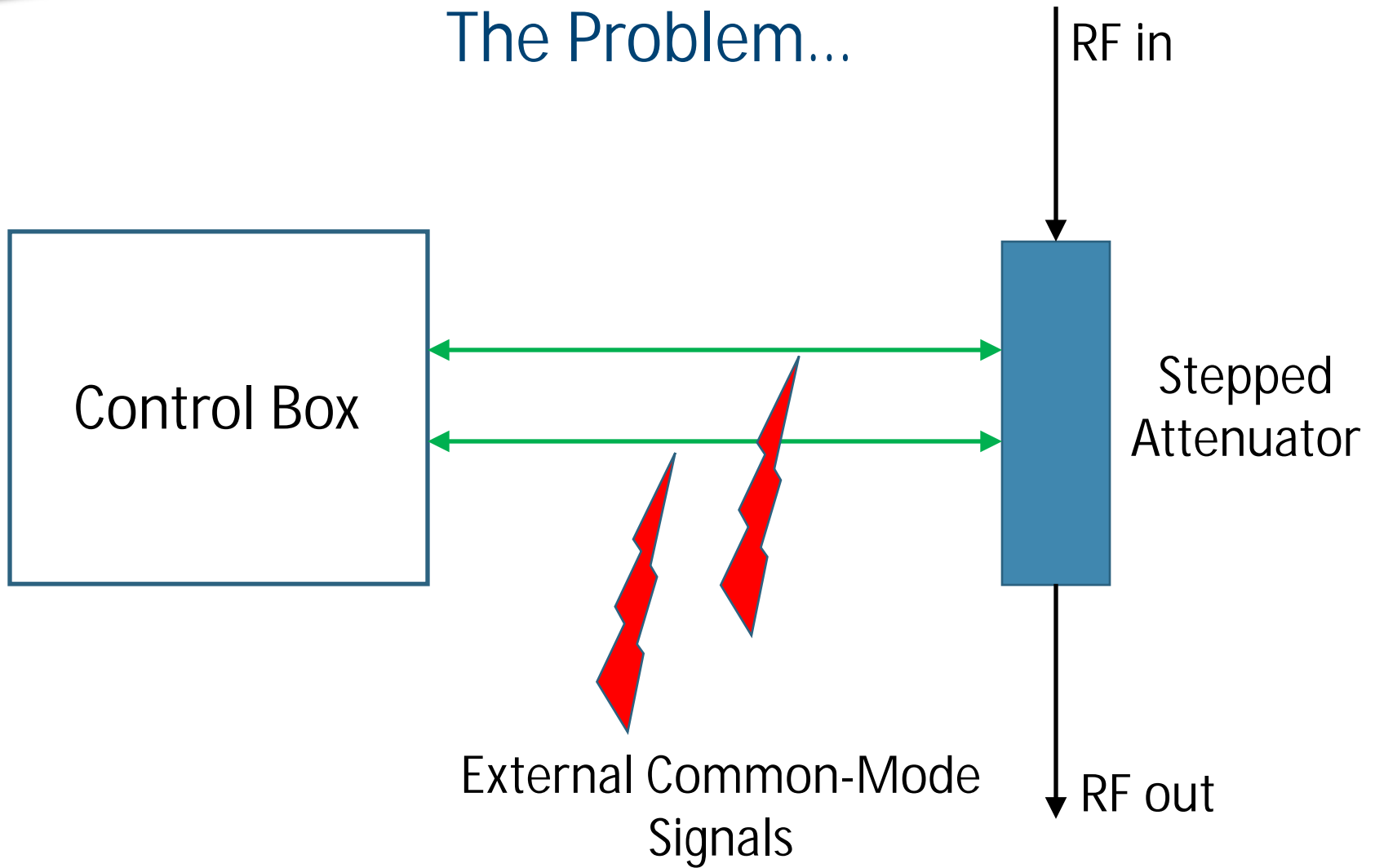


Control Box

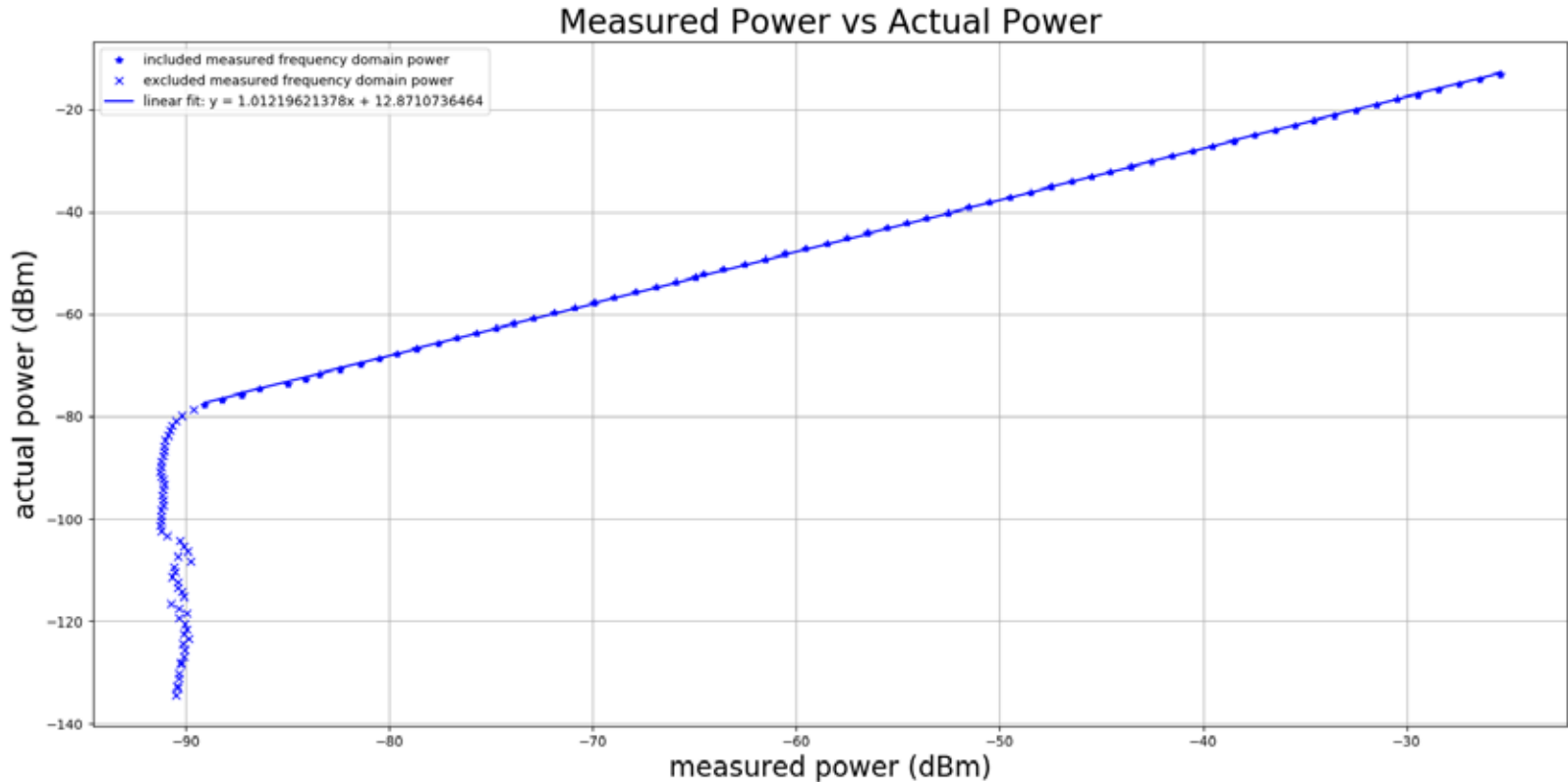
Variable Attenuator



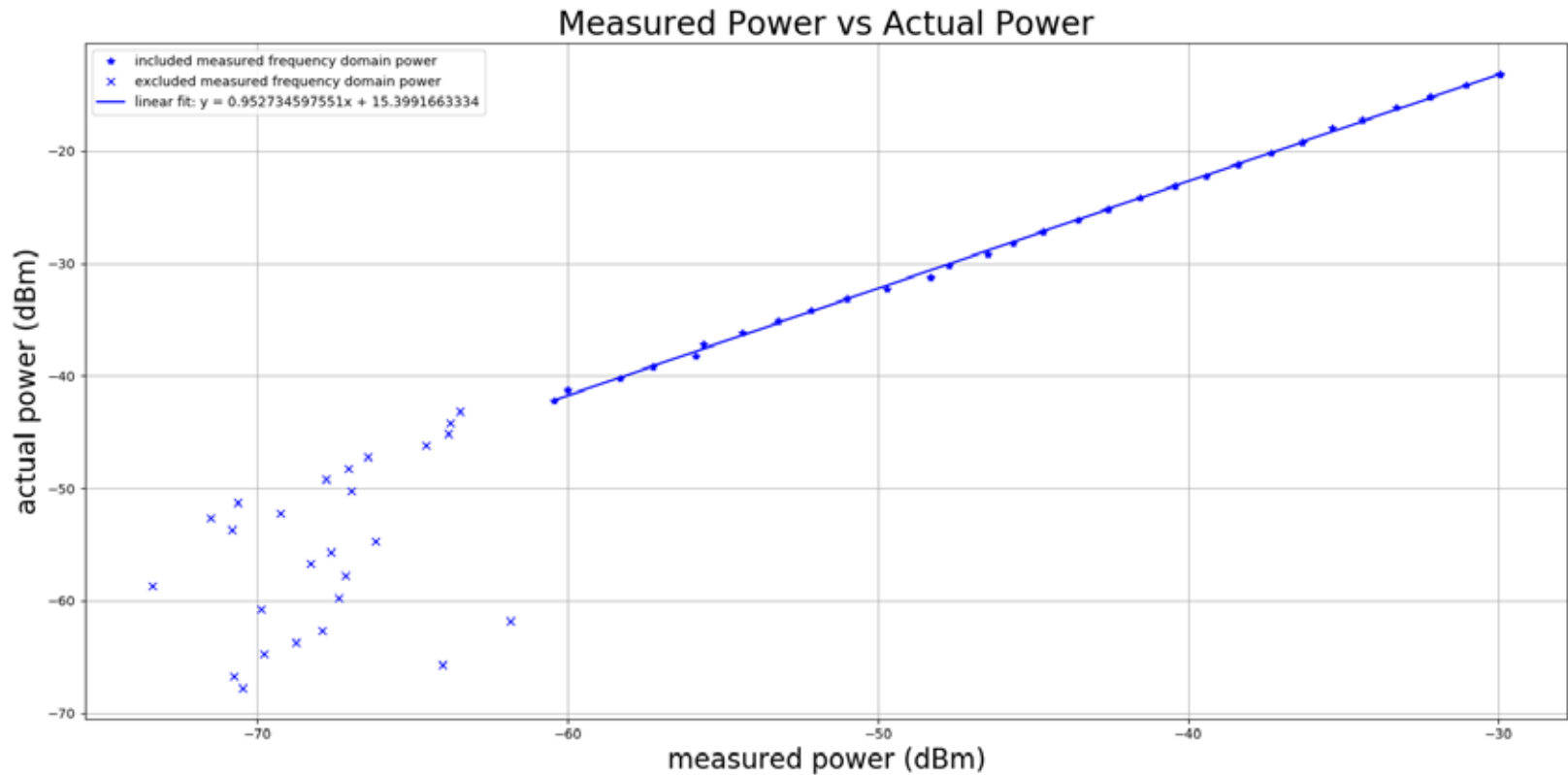
# The Problem...



# A Good Calibration



# The Impact: Common-mode interference messes up calibration



# Let's Perform Propagation Measurements at Two Frequencies at the Same Time...

- Let's now explore what amplifier non-linearity can do to our measurements
- Let's now explore this scenario with a demo

*"The frustration, anger, and insecurity engendered by this situation is responsible for many sleepless nights, ruined marriages, and hateful children"*

- Stephen Maas, Nonlinear Microwave Circuits (Artech House 1988)