SDR in ORBIT: LTE-U

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Breakdown of I/Q plot

- Primary Synchronization Signal
- Secondary Synchronization Signal
Block Diagram
Waterfall Plot
FFT Plot

Amplitude (dB)

Frequency (MHz)

Trace Options
- Peak Hold
- Average
- Avg Alpha: 0.1333

Persistence
- Persist Alpha: 0.1887

Trace Options
- Trace A
- Trace B

Axis Options
- dB/Div:
- Ref Level:

Run
SNR

- Estimate the noise power by measuring the received signal variance

- variance = mean(signal – mean(signal));
- noise power = power(variance,2);
- noise[dB] = 10 log(noise power);
- SNR[dB] = signal[dB] – noise[dB];
OpenAirInterface

OpenAirInterface is divided into 6 repositories:

- OpenAir1
- OpenAir2
- OpenAir3
- OpenAir0
- OpenAir-CN
- Targets
Data Link Layer

- There are 2 sublayers: LLC and MAC

- Data Link Layer Functions
  - LLC establish/control logical links between local devices on a network
  - MAC control access to the network medium to avoid conflicts
  - Data Framing responsible for final encapsulation of messages into frames
  - Addressing label information with a particular destination location
  - Error Detection and Handling
OpenAir2

- Contains MAC/RLC/PDCP and two RRC implementations

- Also contains eNB application (interfaces for user and control planes), X2 Application Protocol (X2AP), and OAI network driver

- OpenAir2 functions is texted by OpenAir1 TestBenches
Next Week

- Continue on OpenAir3 (Network - Layer 3)
- Continue to work on Waterfall plot, and spectrum analyzer
- Continue to work on SNR and SIR