## **GNU Radio Companion: Tutorial 4**

GNU Radio Companion: Tutorial 4 - Introduction to modulation. PSK, constellations, and auto-correlation.

https://www.youtube.com/watch?v=JMEyN\_IvaiE

Time-based	Table of	f Contanto	2
TITLE-Daseu	I able 0		٥

00:42 Random Source

01:19 UChar to Float

01:56 DPSK Modulator

02:12 Phase Shift Keying

05:35 Differential coding

08:42 DPSK Properties

10:23 Position of Throttle

11:05 Constellation Sink Properties

12:00 Fast Auto-correlation Sink

12:57 Demo

12:58 FFT Plot of PSK with no noise

13:15 Fast Auto-correlation of PSK

13:37 Scope Plot of Random Source

13:45 Histogram Plot of Random Source

14:11 Signal Scope of PSK with no noise

14:34 Waterfall of PSK with no noise

14:44 Constellation Plot of PSK with no noise

15:14 Analysis of Gaussian noise with FFT Plot and Histogram

15:39 Additive White Gaussian Noise (AWGN)

16:31 FFT of PSK with noise

16:43 Scope of PSK with noise

16:52 Waterfall of PSK with noise

17:00 Constellation of PSK with noise & Line Link mode

18:46 XY Scope of PSK with noise & Line Link mode

20:13 Auto-correlation of PSK with noise

20:33 Calculation of Auto-correlation analysis duration

22:18 Wrap-around on auto-correlation

23:04 Auto-correlation below the noise floor

23:50 Averaging on Fast Auto-correlation

23:57 CDMA

25:05 Averaged auto-correlation

25:50 Re-cap of Auto-correlation duration calculation

26:17 Calculating position of first FAC peak

27:53 Modulating using QAM

28:36 Constellation Plot of QAM

28:57 Scope Plot of QAM

29:09 Waterfall Plot of QAM & repeating 'blocks'