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Analysis of the Breakout Time

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LANL

3/30/2016

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- Background
- Preliminary Work
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Background

- The motivation to precisely determine breakout time is to better understand initial motion.
- Conduct analysis on the baseline to determine breakout time.
 - Power
 - Phase Angle

Preliminary Work: Spectrogram

Data from Gen III prototype
tests at STL 4.55

CH_3021 @ 1024/128/0

Preliminary Work : Power

Horizontal Lineout for 2.5 GHz

Horizontal Lineout for 2.52 GHz

- The power in the baseline drops by a factor of ~ 6 after the breakout time occurs.
- The characteristic rounded step function of the baseline power can be modeled to calculate the breakout time.

Work done so far: Phase Angle

Phase Change During Breakout

Phase change of ~ 44 deg

Phase Change During Breakout

Phase change of ~ 20 deg

- The characteristic rounded step function of the phase change in the baseline can be modeled to calculate the breakout time.

Preliminary Work: Comparisons

- Power and phase both seem to be viable sources that can be used to find breakout time effectively.
- The phase and power methods complement one another.
 - When one method doesn't work the other can still be used.
- In some cases the breakout time can be slightly shifted between phase and power.

Preliminary Work: Comparisons

Horizontal Lineout for 2.52 GHz

Phase Change During Breakout

Future Work

- Develop a way to quantify the breakout time as well as the associated precision and accuracy.
 - Fit a rounded step function to the power and phase angle data.
 - Utilize both phase and power to minimize errors.
 - Understand what causes inconsistencies between breakout time when calculated with phase and power.

Questions?