# Phase Monitor connections and signals

Connection of monitor

- I have found a 180° hybrid that should work at least for 3 GHz beam.

- At 12 GHz we might have to high voltage to use this device directly.

- Will attempt to use attenuators before, but might potentially have the same problem.

- We will take sum and difference of horizontal and vertical .

- Transport Σ, ΔH, ΔV to gallery to sample.

Phase transient at beginning of pulse

- Phase transient dies after 35 to 40 ns
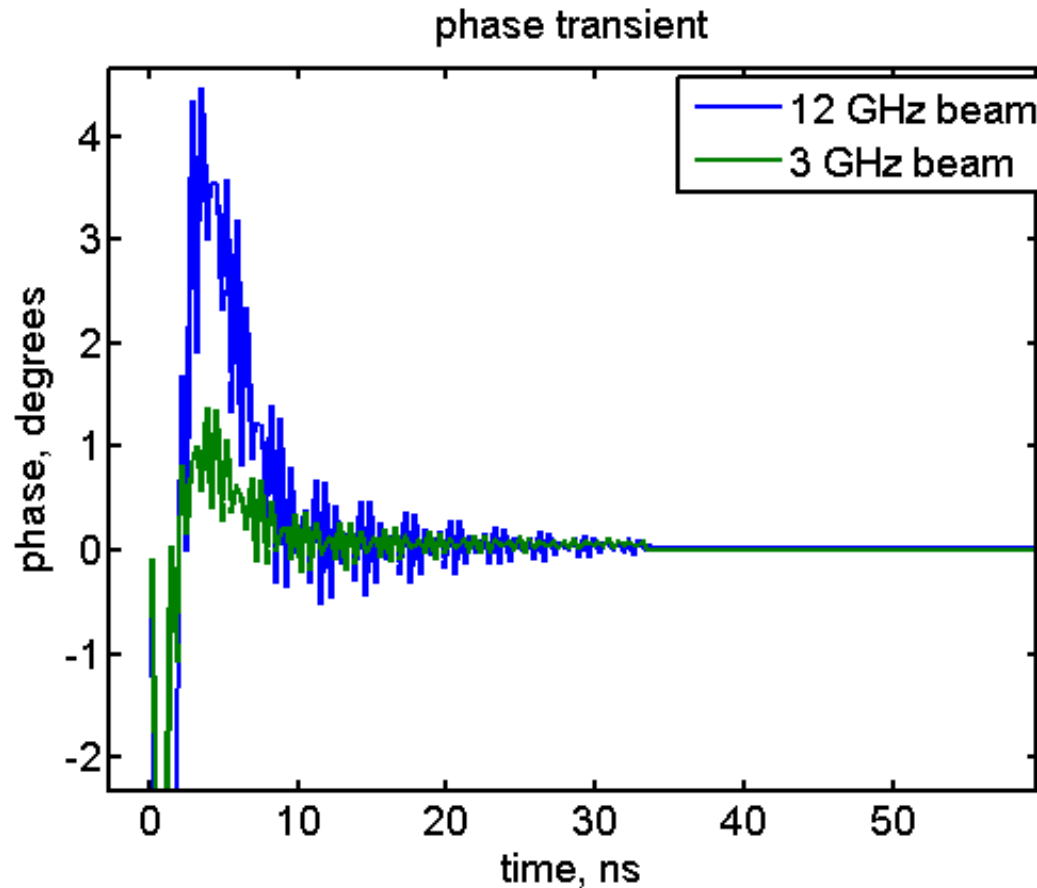
Dipole mode

- Dipole mode is 19dB lower than monopole mode for a 1mm offset.
- That is, 11% amplitude modulation per mm offset.
- Use of 180 ° hybrid will add another 20 dB attenuation. But unsure of use with 12 GHz beam as discussed earlier.
- Should try to keep amplitude modulation <1% above 10 MHz.
- Slow variations matters less, constant offset not at all.

Bunch length dependence

Output amplitude vs. bunch length

- We are more sensitive to variation in bunch length with longer bunches

% bunch length variation to cause 1% change in voltage output
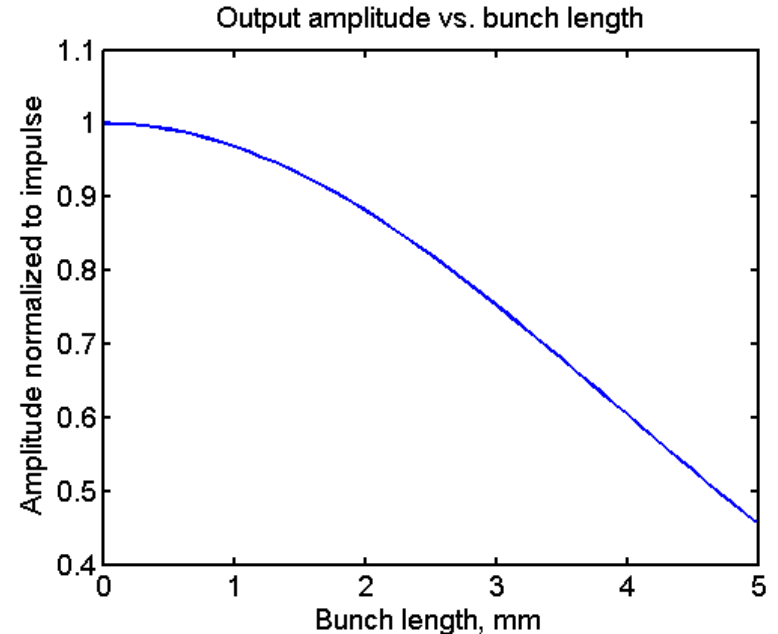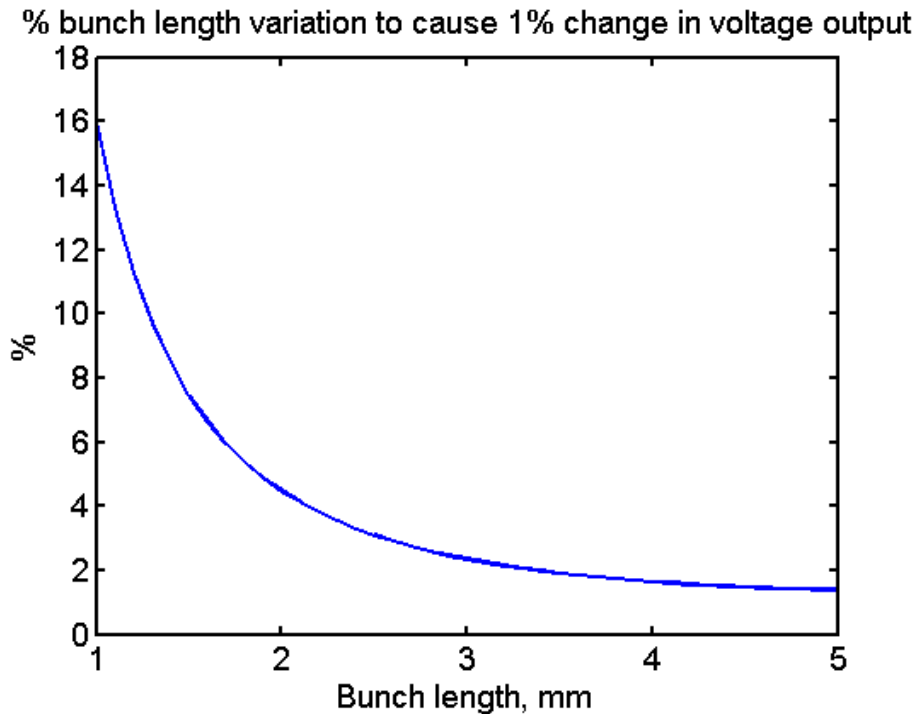
- Again, should try to be below 1% contribution above 10 MHz

State of Electronics

- I am still missing several parts for the electronics that have not yet been delivered.
  - RF relay for calibration, variable attenuator
- In particular, the diodes that will measure the power have not arrived. Should hopefully be here at the beginning of June.
- Since the final output from detectors is low frequency (DC to 50 MHz), gain blocks can easily be constructed to match FPGA digitizers.