



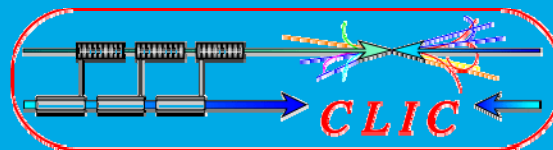
TPMON, WP5(DIAG)



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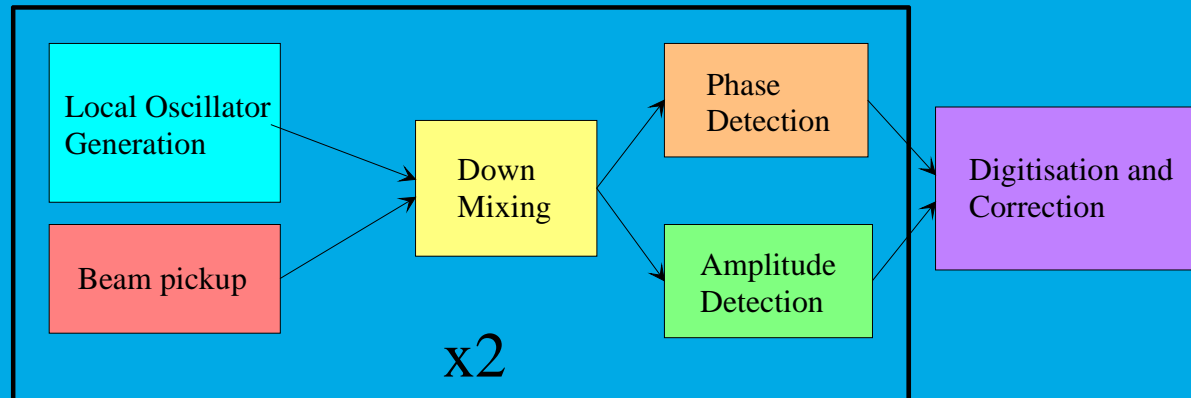
The aim of the task is to investigate the feasibility of a precision bunch train timing measurement at 30 GHz, with an accuracy of 10 fs, and a bandwidth of at least 50MHz. Tests of the electronics have begun at CERN's CTF3.



System Specifications

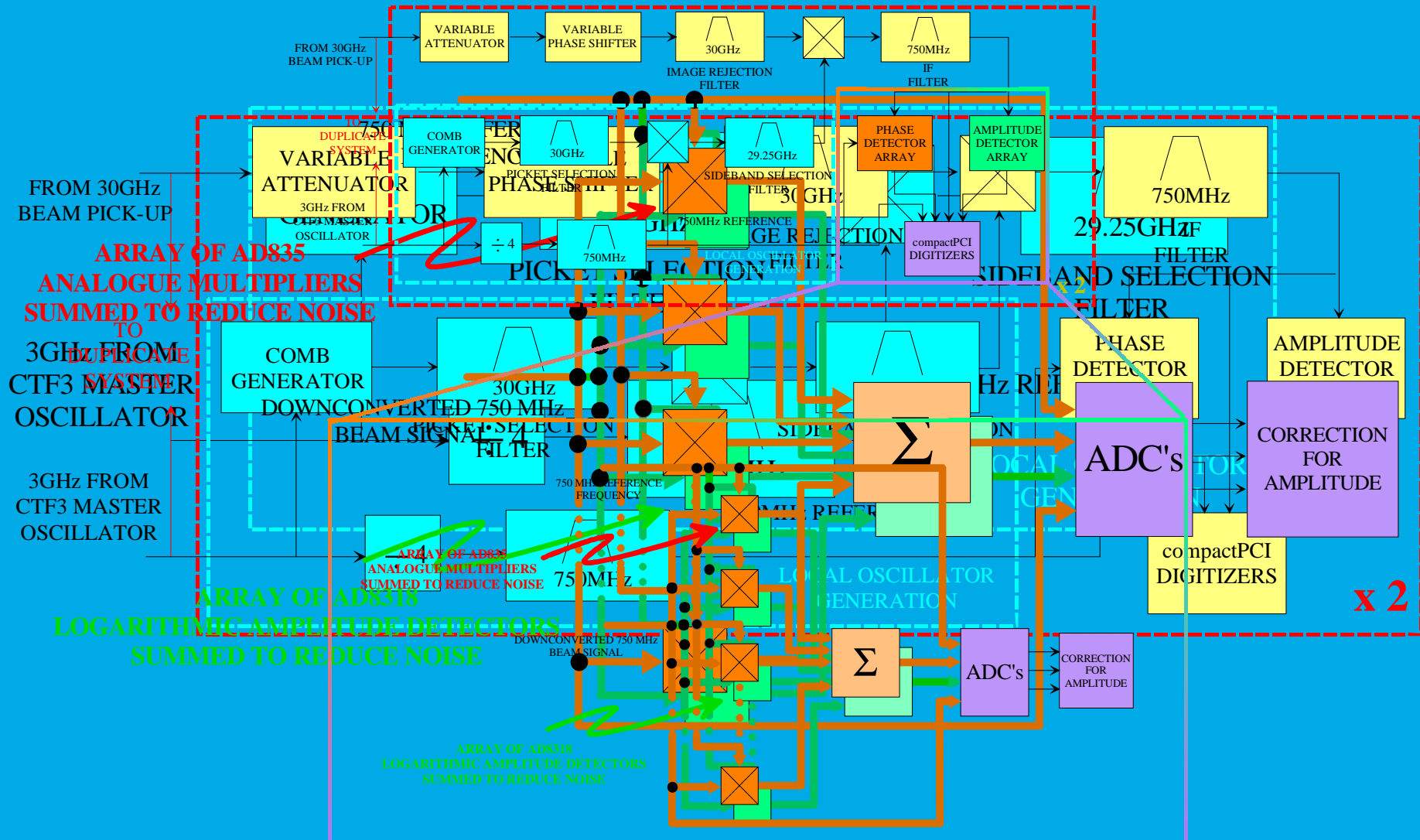
- Phase accuracy: 0.1°
- Amplitude range: $\sim 6\text{dB}$
- Bandwidth: 50MHz, system investigated up to 250MHz

CTF3 test setup

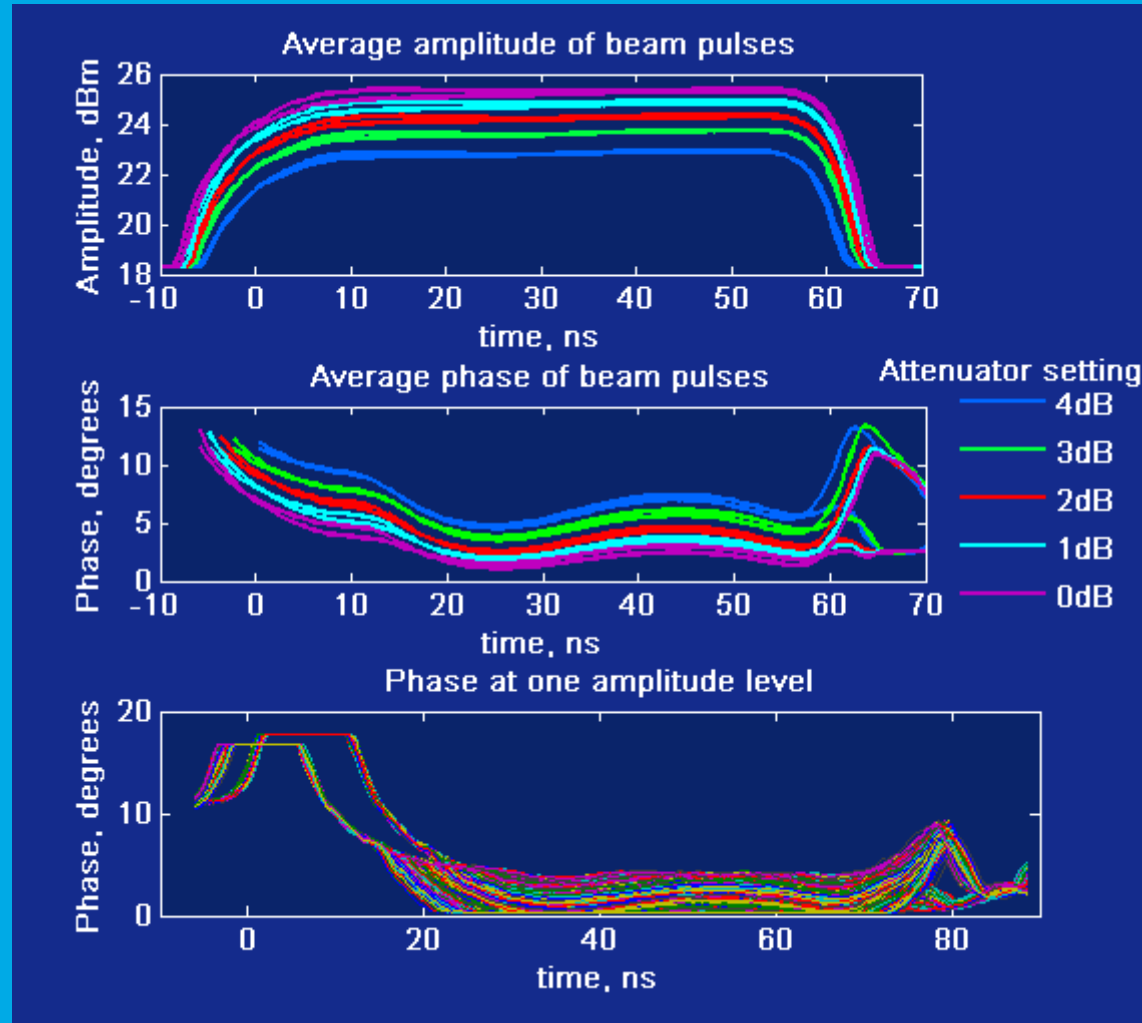


- 30GHz signal is mixed down to 750MHz
- CTF3 beam jitter greatly exceeds the required system accuracy
- Two system are built and compared with each other

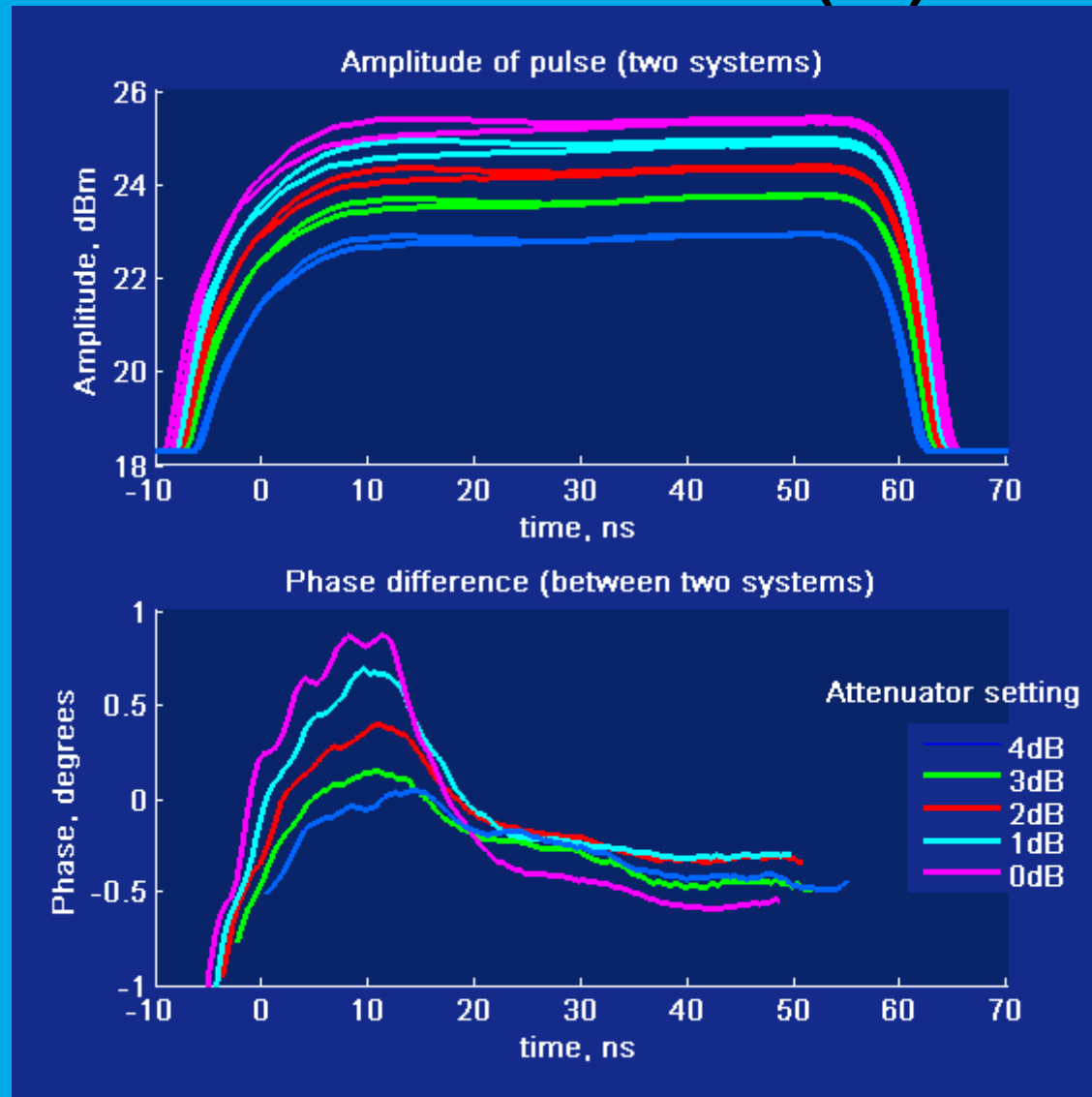
IF System Description



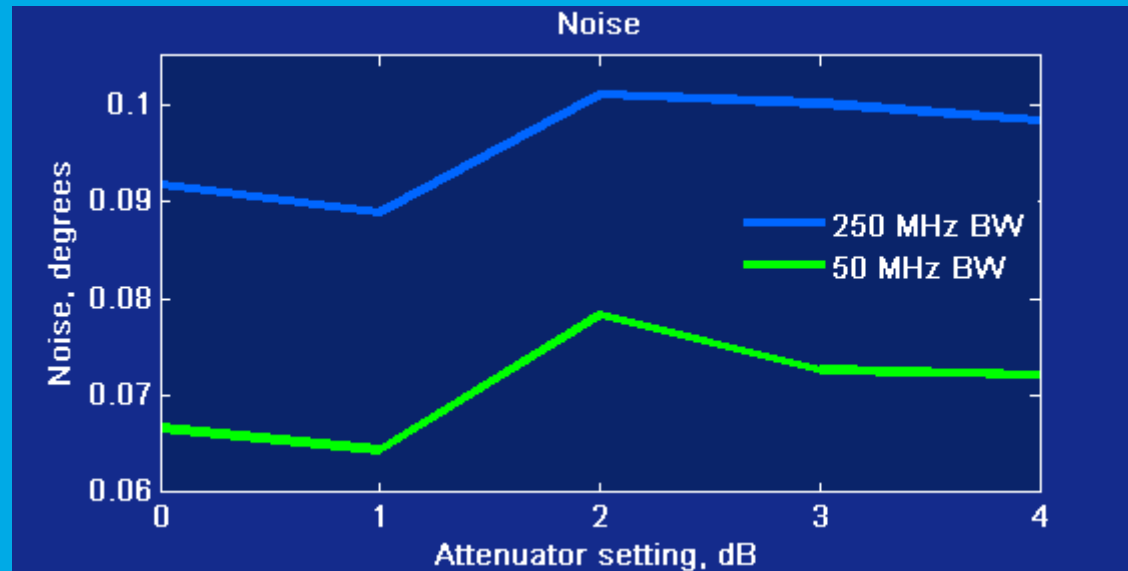
CTF3 results (1)



CTF results (2)



CTF3 results (3)



- This is the noise for two systems
- Noise will increase when amplitude dependent phase offset correction is applied
- Noise measurements look promising at both 250MHz and 50MHz

Work to be completed:

- Complete static correction algorithm to correct amplitude dependent phase offset
- Develop a dynamic correction algorithm to correct step response of the system
- Characterise temperature drift
- Improve calibration routine
- Hardware modifications of down converters
- Further beam tests