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TPMON Status

The objective of the task will be to build the electronics for a high precision RF-based bunch timing measurement system. The phase of a bunch train will be measured at 30GHz with the aim to approach an accuracy of 10fs for a single-shot wideband measurement. An essential part of the work will consist of testing in an accelerator and it is envisaged to do this in CTF3.
Phase detection will be done at an intermediate frequency (IF) somewhere in the range of several hundred MHz. However, choice of an optimum (or even acceptable) IF phase detector is not evident. Firstly available devices have to be carefully characterized and effort is at present concentrating on this.
The figures of merit of a phase measurement devices at the intermediary frequency are the bandwidth, the input amplitude dependence, and the noise floor of the devices. A consideration of the possible IF frequencies is also important for the overall phase measurement system, where higher IF frequencies should in general lead to simpler requirements for the down conversion from 30GHz. A test setup for determining these four factors has been built. The devices to be tested are both phase detectors and power detectors as all phase detectors have some dependence on the input amplitude which must be corrected. To date, all physical devices have been built and tested to satisfaction and support software has been written. Specific test runs remain to be written. The first tests should be written and run within a month and data on the first power and phase detector should be evaluated as well.

Presentation

ILC European Regional Meeting and ILC-BDIR London, June 2005
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