

# LLRF Topical Workshop - Timing, Synchronization, Measurements and Calibration



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## Timing and Synchronization in the LLRF systems of the Fermilab PIP-II Linac

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The PIP-II Accelerator is an 800 MeV superconducting Linac in the injection chain of the Fermilab accelerator complex. The LLRF systems for the 125 cavities which include a few normal conducting cavities in the warm front-end section, use a variety of LLRF hardware components and sub-systems that are part of the timing and synchronization system. This includes a master oscillator and phase averaging reference line, a beam pattern generator to enable beam transfer between non-harmonic RF systems and beam loading compensation systems synchronized to a start of beam trigger. The timing signals are based on a 650 MHz clock with manchester encoded event information and data provided over optical fiber. The timing and synchronization systems and their performance parameters will be described here.

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