Contribution ID: **15** Type: **Oral or Poster**

Dual Frequency Master Oscillator Generation and Distribution for ALS and ALS-U

Wednesday, October 25, 2023 2:46 PM (4 minutes)

The ongoing work to upgrade ALS to ALS-U demands strict RF requirements such as low jitter and low spurs frequency reference to meet its accelerator and science goals. A low phase noise dual frequency Master Oscillator (MO), where the two frequencies are related by a fractional ratio of 608/609 and flexible divide by four frequency outputs has been consolidated into a single chassis. Optical fiber clock distribution system has been selected over the old coax system used in ALS to distribute these signals to various clients across the facility, providing high electrical isolation between outputs and therefore lower phase errors. A Xilinx FPGA ties the MO chassis together by providing a RS-485 interface to monitor and control the system. The new system aims to deliver phase-continuous frequencies with a phase noise (integrated RMS jitter) from 1 Hz to 1 MHz of less than 200 femtosecond per output. This paper will discuss the design, implementation, performance and installation of the new MO generation and distribution system.

Keyword

Primary authors: MURTHY, Shreeharshini Dharanesh (Lawrence Berkeley National Laboratory); JURADO, Angel (Lawrence Berkeley National Laboratory); DU, Qiang (Lawrence Berkeley National Laboratory); FLUGSTAD, Benjamin (Lawrence Berkeley National Laboratory); BETZ, Michael

Session Classification: Posters

Track Classification: Hardware