Contribution ID: **842** Type: **Poster**

Fri-Af-Po.07-06: Development of magnet health monitor systems using optical fiber strain sensors

Friday 4 July 2025 14:00 (2 hours)

The 100T multi-shot (100TMS) and 60T controlled-waveform (60TCW) magnets are signature pulsed magnet systems at the National High Magnetic Field Laboratory (NHMFL) –Pulsed Field Facility (PFF) in Los Alamos. Both magnets are powered by a massive 1.4 GW generator to produce unique pulsed magnetic fields for user experiments. The 100TMS magnet can generate world-record pulsed magnetic fields up to 100.75 T non-destructively, while the 60TCW magnet can deliver magnetic fields up to 60 T with a 100 ms flat-top. These systems are built with concentric coils, which are both costly and time-consuming to construct due to the need for specialized high-strength conductors and reinforcing materials. Therefore, real-time monitoring of the coils' health is crucial for making informed decisions regarding their operation and maintenance. This paper introduces a new system that uses optical fiber Bragg grating strain sensors to monitor deformation at the mid-planes of the coils. The system was tested on one of our 65T magnets, and the evolution of coil deformation during its operation will be presented.

Authors: NGUYEN, Doan; MICHEL, James; LUCERO, Jason; BETTS, Scott

Presenter: BETTS, Scott

Session Classification: Fri-Af-Po.07 - High Field Pulsed Magnets II