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Status report on the MDI alignment monitoring study

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The FCC-ee Machine Detector Interface (MDI) represents a uniquely challenging and compact region, integrating state-of-the-art final focusing technology as close as possible to the interaction point (IP) within the detector. Within this highly constrained environment, a dedicated alignment monitoring system has been developed to track the position of the final focusing quadrupoles and other critical components. The proposed solution combines a deformation monitoring sensor based on in-fiber frequency scanning interferometry (FSI) with conventional in-air metrology. To enhance system coverage, an additional subsystem has been implemented to monitor alignment across the full MDI, linking the final focusing quadrupoles on either side of the detector. This contribution will present the latest developments of the measurement system, including prototype implementations, simulation results, preliminary measurements, and future integration plans. Initial studies on the feasibility of monitoring the vertex detector geometry using this approach will also be discussed.

Author: WATRELOT, Leonard**Presenter:** WATRELOT, Leonard**Session Classification:** Joint effort PED & accelerators**Track Classification:** Physics, Experiments and Detectors: MDI