

## Non-contact Real-time Target Health Monitor

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Targets are an essential part of many accelerator-based experiments, yet their constant radiation exposure eventually affects their internal structure and, consequently, their properties. Current methods typically involve either direct contact with the target or complete removal of the system, which may not be the most efficient for assessing radiation damage. For this reason, a system has been proposed that will monitor a target's radiation damage without the need for direct contact or removal. This sensor will achieve this by measuring the reflectivity of S- and P-polarized waves, which are expected to change measurably due to radiation-induced alterations. As is commonly done, smaller-scale tests were performed to ensure the necessary equipment was functioning correctly. Once all equipment is tested, the next step will be to perform reflectivity measurements using a tungsten sample, a material often used in targets. Longer-term work will involve scaling up the system and implementing higher-energy beams. This sensor will enable a more comprehensive study of radiation damage in materials and is being considered for projects such as Mu2e, Mu2e-II, LBNF, AMF, and muon colliders.