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Beryllium material tests: HiRadMat windows and NOvA fins

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Beryllium is currently widely used in various accelerator beam lines and target facilities as material for beam windows, and to a lesser extent, particle production targets. With plans to increase beam intensities in future accelerator facilities, such as the PIP-II driven Long Baseline Neutrino Experiment (LBNE) at Fermilab, it is essential to take full advantage of the high temperature/strain rate plastic response of beryllium and identify material dynamic limits to avoid compromising particle production efficiency by limiting beam parameters. As a result, an experiment is being designed to investigate the failure mechanisms, limits and flow behavior of several commercial grades of beryllium exposed to intense pulsed proton beams at CERN's HiRadMat facility. The main objectives of this investigation, overview of the experimental set-up, and expected measurements and findings will be presented. A long term in-beam test of Beryllium is also planned using the NOvA MET-02 target. Preparations for inserting beryllium fins in the target will be presented including thermal and structural simulations of beam heating and physical testing using the MET-02 target components.

Primary author: Dr AMMIGAN, Kavin (Fermi National Accelerator Laboratory)

Co-authors: ATHERTON, Andrew (STFC RAL); Dr ZWASKA, Bob (Fermilab); HARTSELL, Brian (FNAL); Dr DENSHAM, Chris (STFC Rutherford Appleton Laboratory); FITTON, Michael (STFC RAL); MCGEE, Michael (Fermilab); CARETTA, Otto (STFC RAL); Mr HURH, Patrick (FNAL); LOVERIDGE, Peter (STFC RAL); ROBERTS, Steve (Oxford University); DAVENNE, Tristan (STFC RAL); KUKSENKO, Viacheslav (Oxford University)

Presenters: ATHERTON, Andrew (STFC RAL); HARTSELL, Brian (FNAL); Dr AMMIGAN, Kavin (Fermi National Accelerator Laboratory)

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