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HiRadMat test of the FCC-ee passive diluter prototype

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Currently a semi-passive beam dilution system is foreseen for the FCC-ee beam dumping system. This system utilizes passive beam diluters (spoilers) made from carbon-based materials. To test the performance of these spoilers, an experiment was carried out in November 2021 at CERN's HiRadMat Facility with scaled prototypes of the proposed spoiler design. By using special beam optics to mimic the extremely flat beam of the FCC-ee, as well as pre-targets to increase the energy deposition, it was possible to create similar mechanical stress fields as expected for FCC-ee operation. To be able to compare the induced surface stresses, live instrumentation of the out-of-plane velocity directly at the beam impact point has been carried out, using a laser doppler vibrometer.

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