

Abstract Submitted  
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**Tuning inter-band scattering mechanism in MgB<sub>2</sub> through ion irradiation**<sup>1</sup> S. PATNAIK, S.D. KAUSHIK, School of Physical Sciences, Jawaharlal Nehru University, New Delhi 110067, India — The effect of light and heavy ion irradiation on Magnesium Diboride thin films is studied. MgB<sub>2</sub> is a two-band superconductor and its electromagnetic response is determined by the relative strength of scattering between the isotropic  $\pi$  band vis á vis the planar  $\sigma$  band. Our results indicate that by suitably choosing the type of ion, fluence, and energy we can control the inter and intra band scattering and thereby alter the physical properties of this intermetallic superconductor. For example, we find that while the anisotropy in upper critical field can be increased with point defects created by Si<sup>+8</sup> ions, it can only be decreased by extended defects formed by heavy ion Au<sup>+15</sup> at same fluence. Similarly while the upper critical field in the direction parallel to c-axis of the film shows enhancement post irradiation with heavy ions, it exhibits some decrease with light ion irradiation. The curvature in H-T phase diagram is also dependent on the defect type. We understand these phenomena within the framework of disorder in multiband superconductivity.

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