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Measurement of H_{c1} in MgB2 thin films and multilayer structures by a microwave absorption technique CHENGGANG ZHUANG, KE CHEN, Temple Univ., SOM TYAGI, Drexel Univ., XIAOXING XI, Temple Univ. — For superconducting RF applications, Gurevich suggested a route to enhance the vortex penetration field, H_{c1} , and thermal breakdown field by a multilayer structure consisting of alternating insulator and superconductor layers with thicknesses smaller than the penetration depth. We have measured H_{c1} of MgB2 thin films and multilayer structures by measuring the microwave absorption of the sample at 9.3 GHz in a TE102 rectangular cavity under an applied magnetic field. The magnetic fluxon penetration into the sample as the applied field is increased to greater than H_{c1} leads to an increase in the microwave absorption. Preliminary results indicate an enhancement of H_{c1} in the MgB2 thin films from the bulk value, consistent with Gurevich's thickness effect model, which is very promising for RF applications of MgB2.

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