

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Microwave stimulated enhancement of the upper critical field in type-II superconducting films ANTONIO LARA, AHMAD AWAD, Universidad Autonoma de Madrid, ALEJANDRO SILHANEK, Universite de Liege, VICTOR MOSHCHALCOV, Katholieke Universiteit Leuven, FARKHAD ALIEV, Universidad Autonoma de Madrid — A few decades ago it was theoretically predicted and experimentally observed that moderate power electromagnetic fields in the GHz range could stimulate superconductivity, increasing the superconducting critical temperature and critical current. Here, on the example of Pb films without / with periodic vortex pinning centers in the form of circular Permalloy dots in the magnetic vortex state, we investigate experimentally how the microwave stimulated superconductivity phenomenon behaves in the presence of a superconducting vortex system. Namely, we present the first, to our best knowledge, experimental investigation of influence of microwave induced superconductivity on the upper critical field of type II superconducting films. An enhancement of the critical temperature of the film of up to 0.1% and of the upper critical field of up to 10% have been observed at a drive frequency of 6 GHz. A qualitative explanation for the observed difference in the dependence of the upper critical field on the temperature and microwave power, depending on the nearly parallel or perpendicular alignments of the field to the sample, is provided.

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Date submitted: 06 Nov 2012

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