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### *Microwave stimulation of superconductivity in the mixed state*

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We have made a comprehensive study about the phenomenon of Stimulation of Superconductivity with Microwaves (MSSC) in the presence of superconducting vortex. In this presentation, we will show experimental measurements of dynamic magnetic permeability measurements in Pb films, with and without the presence of periodic pinning centers. By studying the changes in dissipation at certain configurations of microwave frequencies and powers, we are able to observe an unexpected response of the superconducting vortex lattice, which seems to be "cooled down" by microwaves in a certain range of powers [1]. A further study of this phenomenon on flux avalanches shows again this effect, and how it can reduce the undesired presence of avalanches in real devices [2]. The study has been complemented by experiments on microwave stimulation in the presence of DC current. Corresponding simulations of the Time Dependent Ginzburg Landau (TDGL) equation support our contra-intuitive observation of the notable reduction of dissipation of microwave driven vortex motion.

In collaboration with Alejandro Silhanek, Victor V. Moshchalkov and Yuri Galperin

[1] A. Lara et al., Scientific Reports v.5, p.9187 (2015).

[2] A. Lara et al., Physical Review Applied, v.8, p.034027 (2017).