Electromagnetic response of $LaO_{0.94}F_{0.06}FeAs$:  
AC Susceptibility and Microwave Surface Resistance

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Abstract - We discuss on the electromagnetic response of a polycrystalline sample of Electromagnetic response of $LaO_{0.94}F_{0.06}FeAs$ exposed to DC magnetic fields up to 10 kOe. The low-and high-frequency responses have been investigated by measuring the AC susceptibility at 100 kHz and the microwave surface resistance at 9.6 GHz. At low as well as high DC magnetic fields, the susceptibility strongly depends on the amplitude of the AC driving field, highlighting enhanced nonlinear effects. The field dependence of the AC susceptibility exhibits a magnetic hysteresis that can be justified considering the intragrain-field-penetration effects on the intergrain critical current density. The microwave surface resistance exhibits a clockwise magnetic hysteresis, which cannot be justified in the framework of the critical-state models of the Abrikosov-fluxon lattice; it may have the same origin as that detected in the susceptibility.

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