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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