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Absolute measurements of radio-frequency magnetic susceptibility MATTHEW VANNETTE, Saginaw Valley State University — Radio frequency ($f \approx 1 - 20$ MHz) magnetic susceptibility ($\chi = dM/dH$) measurements show considerable utility in the study of many condensed matter systems. The principle of operation is straightforward and requires little specialized equipment. However, the obtained data (frequency shift, df, of an LC oscillator) suffer from important drawbacks. In metallic samples the data are a convolution of intrinsic magnetic effects and electromagnetic screening due to the normal state skin effect. The convolution can make interpretation of results subtle. More significant, perhaps, is that the data are only semi-quantitative at best. The coefficient that converts df to χ depends on geometric quantities that are either not well known or difficult to determine or both. A method for determining this coefficient by direct measurements of df is presented. This allows for fully quantitative measurements of χ at radio frequencies thereby permitting comparisons across materials and frequencies.

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