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**Magnetization measurements of magnetic fluids** Z. BOEKELHEIDE, C. L. DENNIS, NIST — Magnetic fluids are used for damping in vehicle suspensions, as MRI contrast agents, heat transfer materials, and even in art installations. Most of these applications benefit from high quality magnetic characterization. Techniques for measuring magnetization ($M$) of materials, such as vibrating sample magnetometry (VSM), and superconducting quantum interference device (SQUID) magnetometry, are well-developed for small solid samples such as bulk crystals and thin films. This presentation discusses special issues that arise in measurement of fluid samples. First, the effects of the sample vessel must be taken into account. Often, the vessel must be vacuum-tight; care must be taken that the sealing process does not physically change the properties of the fluid. Then, the portion of the signal due to the sample vessel should be subtracted from the total, not a trivial subtraction as the sample vessel has a different geometry from the sample (in contrast to, e.g., a thin film sample and substrate). In addition, the sample must be centered, adding an additional degree of difficulty when the material is fluid and the center position may be a dynamic property. Our results show that incorrect centering can lead to not only incorrect values of $M$, but to a change in the shape of $M(H)$.

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