Erratum: Structure and dynamics of magnetorheological fluids in rotating magnetic fields [Phys. Rev. E 61, 4111 (2000)]

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It has come to our attention that our paper, Phys. Rev. E **61**, 4111 (2000), duplicates sentences from the paper by O. Sandre, J. Browaeys, R. Perzynski, J.-C. Bacri, V. Cabuil, and R. E. Rosensweig in Phys. Rev. E **59**, 1736 (1999), which was cited in our own paper. We apologize for this oversight.

Both papers consider the rotation dynamics, distortion, and breakup of magnetic fluids subjected to rotating, magnetic fields. Sandre *et al.* consider the problem of droplets of magnetic fluid dispersed in a nonmagnetic medium. Our own paper reports on the problem of dispersions of solid, magnetic particles. Both systems show qualitative similarities in their response to rotating fields. In both cases the microstructures adopt highly elongated fibrils that ultimately possess ''S-shaped'' forms at high rotation rates. They rotate at the frequency of the applied field, but there is a finite phase lag between the field and the average orientation direction of the fibrils. Furthermore, at high frequencies there is sufficient hydrodynamic drag to induce breakup of the fibrils. Indeed, as first observed by Sandre *et al.*, both systems adopt shapes and size distributions to minimize viscous dissipation.

The analytical experimental methods employed by the two laboratories are different. In the work of Sandre *et al.*, the structure of the fibrils is revealed through the use of optical microscopy and small-angle light scattering (SALS). Our work made use of the technique of conservative, linear dichroism. Whereas the use of dichroism leads to a rapid measure of the phase angle and the length of the fibrils, it does average over some of the details that are measured using optical microscopy and SALS.

These two systems do show quantitative differences in responses. For example, from Fig. 8 in the paper by Sandre *et al.*, it is evident that the sine of twice the phase angle scales with frequency to a fractional power for the system of fluid droplets, whereas we find a linear dependence for small frequencies (our Fig. 10) for the particulate system. Certainly the two systems are expected to respond differently, principally due to different restoring forces: surface tension in the case of the droplets and Brownian motion in the case of the particles. Furthermore, the droplets would be subject to internal flows (as studied in their Ref. 13), which would be absent in the case of the particle aggregates.

