

Abstract Submitted
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Dynamics of Two Ferrofluid Drops in a Rotating Field: An Experimental Study¹ CHING-YAO CHEN, WEN-YUAN LO, JUN-YI LU, National Chiao Tung University — Interactions of two ferrofluid drops in a uniform rotational field are investigated. Distinct modes of motion are experimentally observed. The drops remain self-spin without apparent mutual attraction if the initial distance apart is farther than a critical range. If the initial distance is less than the critical range, in addition to self-spins of individual drops, strong magnetic attractive force makes drops approaching closer to contact each other. After the contact, multiple modes of motion are observed. The drops might be locked to form a separated single-magnetized object to proceed self-spin. For a few cases, these locked drops might coalesce after a few rounds. Different mode of interaction after contact is the planetary motion. Instead of drops locked, the drops are bounced away without strong mutual constraint. While proceeds self spins, the drops revolve along their center of mass. Experimental results suggest that, the key factor for these distinct modes of interaction is the approaching speed at the moment of contact, which implies the capillary number is the dominant parameter in the present situation.

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