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It was a pleasant surprise for us to learn that the phenomenon that, we described in a short message [1], is directly related to the famous works of Braginsky [2, 3].

Our initial point of view on the possible causes of this phenomenon no longer seems to us to be perfect. Although, of course, it is still difficult to come to terms with the idea that such a vigorous movement of a spherical YIG sample in an ampoule can be caused by a small (compared to the force of gravity F_T) force $F_i^{(1)}$.

We are grateful to Shapiro for his interest in our work and critical remarks, which, unfortunately, do not contain any quantitative assessments confirming the correctness of his own interpretation of the phenomenon we observe. It should be noted, however, that we actually observed some of the qualitative features of the quasiperiodic motion of a loose sample in an ampoule, which are mentioned in Shapiro's letter: the threshold for the pump power is clearly fixed; sample vibrations arise only when approaching the FMR from the side of weaker magnetic fields; there is a significant hysteresis in the sweep field.

We would also like to clarify the issue of "cutting two samples". Unable to directly measure the forces acting on a loose YIG sample under FMR conditions, we decided to estimate their magnitude using an indirect experiment. It is not difficult to calculate the magnitude of the force with which two identical YIG samples are attracted, magnetized to saturation and located one above the other in the spherical cavity of the ampoule located in the center of the microwave resonator. This force is ~90 F_T. At the moment of passage of the FMR, the samples flew at a high speed in opposite directions (we worked with a magnet with a horizontal gap). Hence, it was concluded that the second term is significan $F_i^{(2)}$ in our formula (1).

Thus, regardless of whether our concept of magnetic resonance forces is correct or erroneous, the movement of a loose sample in an ampoule under NFMR conditions is an experimental fact. Therefore, when interpreting NFMR and MAP, it is necessary to take into account the presence of translational and rotational degrees of freedom in unrestrained samples. The resonant effect of an electromagnetic field can be significant not only at the molecular [4], but also at the macroscopic levels [1].

LITERATURE

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