

Development of an apparatus for observation of the Einstein-de Haas effect

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The Einstein–de Haas effect, rotation by magnetization of a magnetic body, was first reported in 1915 [1]. The effect is categorized together with the Barnett effect [2] as a gyromagnetic effect. We are developing an apparatus to observe the effect.

Figure 1 is a conceptual diagram of the apparatus. A ball shaped specimen hanging by a string is set in the center position of a solenoid coil. When magnetizing the specimen, it will rotate around the string as an axis of rotation. The rotation will be observed by projection of a laser spot on a wall reflected by a mirror that is placed upper side of the specimen. The magnitude of the rotation angle is known by the migration length of the laser spot on the wall and the distance between the wall and the mirror. The numerical data of time-dependent migration length of the laser spot on the wall is obtained by the image analysis of the video. The frequency of the Einstein–de Haas effect and the others are distinguished by means of frequency analysis.

The details of the apparatus and some experimental results will be shown in the session.

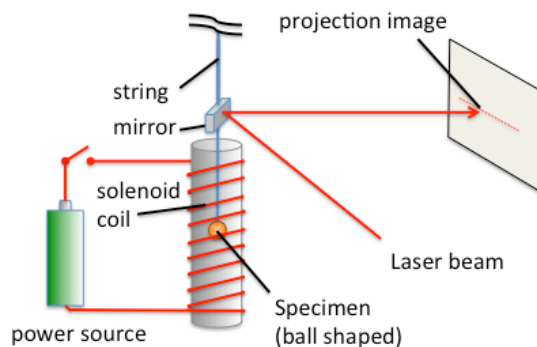


Fig.1 a conceptual diagram of the apparatus.

[1] A. Einstein and W. J. de Haas, Verh. Dtsch. Phys. Ges. **17**, 152 (1915).

[2] S. J. Barnett, Phys. Rev. **6**, 239-270 (1915).