Study of the dynamic coupling via spin currents

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PhD may follow: Yes

Summary :
The purpose of this training is to measure the spin pumping emitted by a magnetic insulator.

Full description :
One of the potential field of application of nano-magnetism is communication technology where magnetism is used here for its non-reciprocal properties, combined with a wide tunability very high selectivity. The expected properties depend greatly upon the choice of the material. So far the best results were obtained with yttrium iron garnet (YIG) that is found in high-end microwave components. France has in this area a unique expertise in the growth of thin film of high quality YIG. Very recently, the first YIG-based nano-devices have emerged opening a very large field of potential applications for the communications industry. The purpose of this training will be to study the dynamical properties of these nano-objects. The student will have access to YIG nano-structure. The objetive will be to measure the dynamical behavior of these nano-objects when inserted into a device. In particular we will focus on spin pumping flowing in an adjacent normal metal. The goal will be to understand the basic physical phenomena that control electronically the dynamics of these nano-objects.
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Requested skills :
Sound knowledge in solid state physics