

Spin current phenomena: new impetus to Spintronics

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In recent years several phenomena have been discovered in magnetic nanostructures in which the transport of carriers depends on their spin. In addition to the long time known charge and heat currents, these phenomena also involve spin currents. Among them there are the spin Hall effect (SHE), the inverse spin Hall effect (ISHE) and the spin Seebeck effect (SSE). These effects, which occur in conductors as well as in insulators, make possible the conversion from one type of current to another in very efficient processes opening new possibilities for the development of spintronics. We will review recent developments in this area and present some of our results on the amplification of spin waves obtained with the spin Hall and spin Seebeck effects.