

How to characterize spin current in mesoscopic system?

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Spin current, flow of spin angular momentum has been playing key role in spintronics in recent years, because it is critical to control magnetization in static and dynamic fashion. However, since it is difficult to isolate spin current from charge current, understanding the nature of spin current itself remains elusive. I will talk about the characteristics using non-local spin valve device with Larmor precession. We found the velocity of spin current depends on the junction properties [1]. This motivates to study spin transport in atomically flat interface such as 2d van der Waals (vdw) hetero-structure. After introducing recent study of vdW tunneling junctions with magnetic materials [2], I also discuss opportunities of spin transport, optics and magnetism in 2d van der Waals materials, with the emphasis of using color centers in solids [3].

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