Pressure Modification of Anomalous Hall Effect in Layered Fe_3GeTe_2

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Keywords: high pressure, anomalous hall effect.

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We report the pressure effect on structure, transport and anomalous Hall effect for layered ferromagnetic Fe_3GeTe_2. The crystal of Fe_3GeTe_2 sustains its hexagonal phase under pressure up to 25.9 GPa. The Curie temperature decreases monotonously with increasing pressure. By applying appropriate pressure the large intrinsic anomalous Hall effect is efficiently tuned due to the two spin-orbit coupling split bands moving into unoccupied Fermi sea. With loading compression, the anomalous Hall conductivity increases to its maximal value when Fermi level lies between the split bands, and then attenuates when the split bands float upon the Fermi level. Our work demonstrates that pressure is an effective method to modulate the anomalous Hall conductivity of magnetic materials, which helps for further understanding the mechanism of large intrinsic anomalous Hall effect.

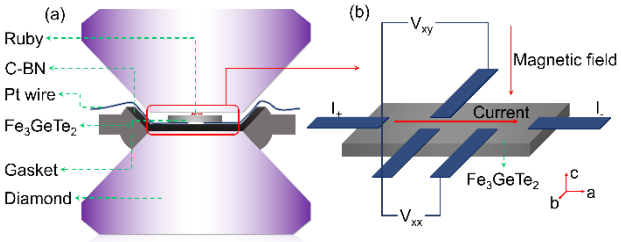

Figure 1. High pressure transport measurement system.