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Quantum anomalous Hall effect in the shin film of magnetic topological insulators and semimetals[1]

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The great interests on Hall effects come with their quantization under certain conditions.By now all five types of the Hall effects have been discovered, and the only remaining one is the quantized anomalous Hall effect, which is the quantized Hall effect without external magnetic field and the formation of Landau levels. In the present talk, I will summarize two possible ways proposed by our group to reach such an effect, which are thin films of magnetically doped topological insulators and topological semimetals. I will mainly focused on the latter proposal, which is important in the following sense. First the proposal is based on the stoichiometric material, which is very good for obtaining large mobility. Second, the exchange coupling energy between the magnetization and the valence electrons is of the order of eV, which makes QAHE more easy to be realized.

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