“Electronic and spin structure investigations on Dirac and Rashba materials and beyond”

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Abstract

It is of great interest to create the inversion asymmetric topological insulators because these materials are desirable for hosting both a large Rashba spin-splitting (RSS) and robust topological surface states (TSS), which are potentially interesting in realization of new topological phenomena in practical material systems.

In first part of the talk, I will discuss on the growth of various TIs by modified Bridgman method using rotating heat field [2] and in particular built in p-n junction [3] will be considered. Recent results on the BiTeI electronic structure [1] transformation forming a sequence of intermediate spin-polarized states, reflecting the transition from RSS to a mixed type of states characterized by gapless TSS and preserving RSS will be presented.

In the second part of the talk, I will concentrate on the experimental study of polarized cathodoluminescence induced by low-energy spin-polarized electrons injected into GaAs/AlGaAs QWs structures with the aim to create 3D spin-detector with spatial resolution which can be integrated into the registration channel of modern ARPES systems.


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