

CEA - Saclay 91191 Gif-sur-yvette Cedex
Service de Physique de l'Etat Condensé
SÉMINAIRE

Mercredi 14 septembre 11h15

Orme des Merisiers SPEC Salle Itzykson, Bât.774

Magneto-transport studies of strained HgTe topological insulators

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Topological insulators is a class of material conducting on the surface and not in the bulk. In HgTe a P band is inverted with respect to an S band (negative gap): this changes this semiconductor for insulator to topological insulator. A bandgap can be opened by growing it on a substrate with a lattice mismatch which strains homogenously the material. The conducting surface states lie partly in this bandgap. Using a gated Hall device we have

- done the spectroscopy of the Dirac states in weak field magneto-transport, placing the Dirac point with a 100 microvolt accuracy
- observed antilocalization correction to the conductivity, typical of Dirac Fermions
- analyzed the dependence of the chemical potential with density using Shubnikov deHaas frequencies.
- Observed two sets of Hall plateaus: a half odd integer serie, consistent with a single Dirac cone and an integer serie which is unexpected. An insulating phase appears at high field.

The talk will cover only a fraction of this material for pedagogical reasons.

A coffee break will be served at 11h00. The seminar will be given in English.