

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

Jeudi 21 juin 14h15

Orme des Merisiers SPEC Salle Itzykson, Bât.774

Spin thermopower in interacting quantum dots

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Using analytical arguments and the numerical renormalization group method, we investigate the spin thermopower of a quantum dot in a magnetic field. In the particle-hole-symmetric situation, the temperature difference applied across the dot drives a pure spin current without accompanying charge current. For temperatures and fields at or above the Kondo temperature, but of the same order of magnitude, the spin-Seebeck coefficient is large, of the order of k_B/e . Via a mapping, we relate the spin-Seebeck coefficient to the charge-Seebeck coefficient of a negative-U quantum dot. For several regimes, we provide simplified analytical expressions.

In the Kondo regime, the dependence of the spin-Seebeck coefficient on the temperature and the magnetic field is explained in terms of the shift of the Kondo resonance due to the field and its broadening with the temperature and the field. We also consider the influence of breaking the particle-hole symmetry and show that a pure spin current can still be realized, provided a suitable electric voltage is applied across the dot. Then, except for large asymmetries, the behavior of the spin-Seebeck coefficient remains similar to that found in the particle-hole-symmetric point.

Invitant: Jean-Louis Pichard

The seminar will be given in English.

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