

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

Mercredi 6 Novembre 2013 à 11h15

Orme des Merisiers SPEC, Salle Itzykson, Bât.774

Modifying an interference pattern, stopping electrons and other fun things that can be done with voltage pulses (The noise is the noise, focus on the signal)

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As a general trend, nanoelectronics experiments are shifting toward frequencies in the GHz range and beyond. These frequencies are now so high that they become comparable to the internal characteristic time scales that set the quantum dynamics of the devices, resulting in new opportunities for studying the dynamical aspects of quantum mechanics. In this talk, I will propose several mesoscopic experiments based on fast voltage pulses sent through a device. We shall find that extremely fast pulses provide a conceptually new tool for controlling quantum information: the possibility to dynamically engineer the interference pattern of the different trajectories taken by the electrons. Striking physical signatures are associated with this regime: restoration of the interference pattern in the presence of large bias voltages, negative currents with respect to the direction of propagation of the voltage pulse, oscillation of the total transmitted charge with the total number of injected electrons.

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

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