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Service de Physique de l'Etat Condensé
SÉMINAIRE

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Orme des Merisiers SPEC Salle Itzykson, Bât.774

Topological effects in superconducting circuits: application
to metrology

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This talk focuses on the quantum degeneracies in superconducting circuits with Josephson junctions. They occur at some values of the gate voltages and fluxes used to tune the circuit. For three junction circuits, the degeneracies are isolated points in the gate voltages-flux parameter space. For four junctions or more, there are lines or planes of degeneracies.

At a degenerate point, the phase of the wavefunction is undefined. Hence the degeneracy acts as a "topological defect" in adiabatic transport. It has a "topological quantum number" which quantizes the charge transferred for some classes of closed cycles.

This effect is studied experimentally in a phase-biased Cooper pair pump, and new readout current techniques will be presented.

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