ID de Contribution: **40**

Type: **Non spécifié**

Resolving the nonequilibrium Kondo singlet in energy-and position-space using quantum measurements (ONLINE presentation)

mercredi 15 septembre 2021 15:00 (1 heure)

The Kondo effect, a hallmark of strong correlation physics, is characterized by the formation of an extended cloud of singlet states around magnetic impurities at low temperatures. While many implications of the Kondo cloud's existence have been verified, the existence of the singlet cloud itself has not been directly demonstrated. We suggest a route for such a demonstration by considering an observable that has no classical analog, but is still experimentally measurable:"singlet weights", or projections onto particular entangled two-particle states. Using approximate theoretical arguments, we show that it is possible to construct highly specific energy-and position-resolved probes of Kondo correlations. Furthermore, we consider a quantum transport setup that can be driven away from equilibrium by a bias voltage. There, we show that singlet weights are enhanced by voltage even as the Kondo effect is weakened by it. This exposes a patently nonequilibrium mechanism for the generation of Kondo-like entanglement that is inherently different from its equilibrium counterpart.

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