Canadian Association of Physicists

Association canadienne des physiciens et physiciennes

Contribution ID: **1717**　　　　Type: **CLOSED - Oral (Non-Student) / orale (non-étudiant)**

Seeing the strongly-correlated zero-bias anomaly in double quantum dot measurements

Tuesday, 30 May 2017 12:00 (15 minutes)

The combination of disorder and interactions generally leads to a suppression in the single-particle density of states in bulk electronic systems. Numerical studies of the Anderson-Hubbard model point to a unique zero-bias anomaly in strongly correlated materials with a width proportional to the inter-site hopping amplitude t. A zero-bias anomaly with the same parameter dependence also appears in ensembles of two-site systems. We describe how this zero-bias anomaly in two-site systems is reflected in existing data from double quantum dots, and we propose a method to see the zero bias anomaly explicitly, emphasizing that it is a unique signature of the presence of strong correlations.

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Session Classification: T2-1 Computational and Theoretical Condensed Matter (DCMMP) | Matière condensée numérique et théorique (DPMCM)

Track Classification: Condensed Matter and Materials Physics / Physique de la matière condensée et matériaux (DCMMP-DPMCM)