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【570】Coupled Quantum Dots in Bilayer Graphene with Tunable Barriers

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Exploiting the band-gap induced by perpendicular electric fields, charge carriers in bilayer graphene can be confined via electrostatic gating. This realization provides a versatile and tunable platform hosting carbon-qubits.

We confine charge carriers to a narrow channel, defined by lateral gating. Another layer of gates, perpendicular to the transport direction, locally tune the carrier density in this channel. They serve as either plunger gates or tunnel barriers. A range of coupled multi-dot systems are formed, where the occupation can be tuned to the few-carrier regime in single dots. The tunnel couplings can be varied by more than two orders of magnitude, allowing us to study fully tunable quantum dot arrays of arbitrary polarities and couplings.

Primary authors: Dr EICH, Marius (ETH Zürich); Ms TONG, Chuyao (ETH Zurich)

Co-authors: Ms GARREIS, Rebekka (ETH Zurich); Dr KURZMANN, Annika (ETHZ - ETH Zurich); Dr LEE, Yongjin (ETH Zürich); Dr PISONI, Riccardo (ETH Zürich); Dr RICKHAUS, Peter (ETH Zürich); Prof. TANIGUCHI, Takashi (National Institute for Material Science); Prof. WATANABE, Kenji (National Institute for Material Science); Prof. IHN, Thomas (ETH Zürich); Prof. ENSSLIN, Klaus (ETH Zürich)

Presenter: Ms TONG, Chuyao (ETH Zurich)

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