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Coulomb-energy-dependent tunnelling from few-electron dynamic quantum dots defined by surface acoustic waves MICHAEL ASTLEY, MASAYA KATAOKA, CHRIS FORD, CRISPIN BARNES, DAVE ANDERSON, GEB JONES, IAN FARRER, DAVE RITCHIE, MIKE PEPPER, Cavendish Laboratory, University of Cambridge — Electrons confined in dynamic quantum dots (DQDs) have been proposed as an implementation for the control and manipulation of quantum information. In this scheme, entanglement is achieved at a tunnel barrier between neighbouring DQDs. In this presentation we investigate the escape rate from a DQD at a tunnel barrier. One or few electron DQDs were created by a surface acoustic wave travelling through a pinched-off channel, isolated from a reservoir by a narrow tunnel barrier. The tunneling rates across the barrier were determined using a rate-equation model, and found to increase with the electron occupation of the DQD. This effect can be explained in terms of Coulomb interactions between the confined electrons.

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