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Transient current in a quantum dot asymmetrically coupled to metallic leads ALI GOKER, PETER NORDLANDER, Department of Physics and Rice Quantum Institute, Rice University, Houston, TX 77251, USA — We use the time-dependent non-crossing approximation to study the transient current for a single electron transistor attached asymmetrically to two metallic leads. We investigate the effects of the bandwidth of the leads, the effect of dot energy level position, the effect of asymmetry in the couplings, and the effects of temperature. In the short timescale, the current reaches a maximum before it starts decaying. In the long timescale, we observe sinusoidal modulations of the current. The frequency of these oscillations is linearly proportional to the bandwidth of the conduction electrons in the leads. The amplitude of these oscillations are found to increase as the temperature is reduced and saturate for temperatures below the Kondo temperature. We discuss the microscopic nature of these oscillations and comment on the possibilities for their experimental detection.

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