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Shot Noise in Single-Electron Tunneling through Quantum Dots: A Toolbox to Study Quantum Physics Prof. Rolf J. HAUG

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Abstract: Shot noise in electronic transport originates from the discrete nature of the electric charge. It was first introduced in 1918 by Walter Schottky who studied fluctuations of current in vacuum tubes. Later on it was understood that the magnitude of shot noise depends on correlations among the electrons. Therefore, shot noise measurements are a tool to come to an understanding of correlations in a system. In studying shot noise in transport through quantum dots, i.e. quasi zero-dimensional systems in semiconductors, where only single electrons are allowed to tunnel, one has access to quantum mechanical correlations in these systems in a variety of ways.

In the talk studies of shot noise in single-electron tunneling through quantum dots will be reviewed and it will be shown how one can analyze and manipulate the observed noise [1,2,3].

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[2] N. Ubbelohde, F. Hohls, V. Kashcheyevs, T. Wagner, L.
Fricke, B. Kästner, K. Pierz, H.W. Schumacher, R.J. Haug;
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[3] T. Wagner, P. Strasberg, J.C. Bayer, E.P.
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12, 218 (2017)

