**Shot noise suppression in tunneling through a single GaAs/AlAs/GaAs Si δ-doped barrier measured by crosscorrelation technique**

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**Introduction -**

Nowadays semiconductor heterostructures and devices become smaller and smaller. Therefore electronic transport properties of small electronic systems are substantially influenced by electronic processes related to thermal agitation and quantum transitions of electrons and quasiparticles. The purpose of this presentation is to present our first results of the shot noise measurements in single barrier tunneling structure with planar δ-doping inside the barrier.

**Fluctuations (noise):** spontaneous, random (stochastic) deviations from the time-average of the physical quantity. They manifest a thermal agitation and quantum (discrete) nature of matter (charge, spin, etc...).

**Quantum Shot Noise**

- consequence of the quantization of charge;
- can be used to obtain information on a system which is not available through conductivity measurements;
- shot noise experiments can determine the change and statistics of the quasiparticles relevant for transport;
- is generally more sensitive to the effects of electron-electron interactions than the conductance measurements.

**Fano factor**

\[ F = \frac{\text{noise}}{\text{mean}} \]

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