## Meeting abstract

# Shock waves in nanomechanical resonators

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The dream of every surfer is an extremely steep wave propagating at the highest speed possible. The best waves for this are would be shock waves, but are very hard to surf. In the nanoscopic world the same is true: the surfers in this case are electrons riding through nanomechanical devices on acoustic waves. Naturally, this has a broad range of applications in sensor technology and for communication electronics for which the combination of an electronic and a mechanical degree of freedom is essential. But this is also of interest for fundamental aspects of nano-electromechanical systems (NEMS), when it comes to quantum limited displacement detection and the control of phonon number states. Here, we study the formation of shock waves in a NEMS resonator with an embedded two-dimensional electron gas using surface acoustic waves. The mechanical displacement of the nano-resonator is read out via the induced acoustoelectric current. Applying acoustical standing waves we are able to determine the anomalous acoustocurrent. This current is only found in the regime of shock wave formation. We ontain very good agreement with model calculations.