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Noise of a Tunnel Junction Biased in Temperature SAMUEL LAROCQUE, EDOUARD PINSOLLE, CHRISTIAN LUPIEN, BERTRAND REULET, Univ of Sherbrooke — Caloritronic in small systems has been of high interest in the recent years as new ways to manipulate electronic heat currents at the nanoscale have been developped, such as heat pumps and refrigerators based on quantum dots or diodes. In such systems, the link between average heat and electrical currents has been studied (Seebeck and Peltier effects). The next logical step in the characterization of caloritronics is to measure the link between heat or electrical current fluctuations in the presence of a temperature gradient. We present the measurements of electrical current fluctuations across a tunnel junction driven out of equilibrium by a temperature difference between the contacts, i.e. in the presence of a heat current but no electrical current. In order to create a controlled temperature difference, we use a micro-wire heated by Joule effect as one electrode of the tunnel junction while the second is in contact with a thermal reservoir at millikelvin temperatures. We observe how the current noise is affected by the presence of the heat current and compare our results with theory.

Samuel Larocque
Univ of Sherbrooke

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