

Thermoelectric effect in photon-assisted, spin-polarized tunnelling through a quantum dot.

K. Bocian¹ and W. Rudziński¹

¹*Faculty of Physics, Adam Mickiewicz University,
ul. Umultowska 85, 61-614 Poznań, Poland*

Features of electric and thermal conductance, Seebeck coefficient as well as proper figure of merit in tunnelling through a single level quantum dot connected to external ferromagnetic leads are investigated theoretically using the equation of motion method within the nonequilibrium Green function technique. The influence of the harmonic ac field on the transport characteristics for the considered system is discussed in detail. In particular it is shown that the photonic field strongly modulates the Seebeck coefficient resulting in multi-peaks structure of figure of merit. Different mechanisms leading to enhancement of the thermal conductance for the case of spin-polarized transmission are explained. Thermoelectric phenomenon in a hybrid junction modified by attaching to the dot also the third, superconducting lead, is also discussed.