

Phonon-affected thermoelectric effects in a double quantum dot system attached to magnetic leads

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Thermoelectric effects in a double quantum dot system coupled to phonon bath and attached to external magnetic leads are investigated theoretically by means of nonequilibrium Green's function approach. The basic thermoelectric transport characteristics, like thermopower, electronic contribution to heat conductance, and the corresponding figure of merit, have been calculated in the Hartree-Fock approximation for Coulomb interactions. An enhancement of the thermal efficiency (figure of merit ZT) due to Coulomb blockade has been found. The magnitude of ZT is further modified by electron-phonon interactions. The influence of spin-dependent transport and spin bias on the thermoelectric effects (like Seebeck and spin Seebeck effects [1]) is also analyzed.

References:

[1] K. Uchida, S. Takahashi, K. Harii, J. Ieda, W. Koshibae, K. Ando, S. Maekawa, and E. Saitoh, *Nature (London)* **455**, 778 (2008).

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