

# THERMOELECTRIC EFFECTS IN PLANAR TUNNEL JUNCTIONS

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The selected thermoelectric effects in the planar tunnel junction consisting of the ferromagnetic layers and the nonmagnetic tunnel barrier are analyzed in the free-electron-like spin-polarized one-band model. Especially the influence of the parameters of the junction as well as the relative orientation of magnetic moments on the thermopower and the spin-transfer torque generated by the temperature difference across the tunnel junction is investigated. The thermopower can be related to the voltage drop generated by the temperature difference under the condition that the charge current vanishes. It depends on the magnetic configuration of the junction. In junctions with high barriers the thermopower is maximal in the antiparallel configuration and it can be enhanced in the junctions with strong spin splitting of the electron bands. The component of the torque studied in the present paper is oriented in the plane formed by magnetic moments and it appears in the absence of the bias voltage. Its magnitude is insensitive to the sign of the temperature difference in contrast to the bias-induced torque which strongly depends on the polarization of the bias. The studied torque is usually smaller than the torque generated by the bias, however it can be significant in the junctions with low barriers.

9.7 cm

13.4 cm

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