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Generalized non-Local Resistance Expression and its Application in F/N/F Spintronic Structure with Graphene Channel[1] HUAZHOU WEI, SHIWEI FU, China University of Petroleum - Beijing — We report our work on the spin transport properties in the F/N/F(ferromagnets/normal metal/ferromagnets) spintronic structure from a new theoretical perspective. A significant problem in the field is to explain the inferior measured order of magnitude for spin lifetime. Based on the known non-local resistance formula and the mechanism analysis of spin-flipping within the interfaces between F and N, we analytically derive a broadly applicable new non-local resistance expression and a generalized Hanle curve formula. After employing them in the F/N/F structure under different limits, especially in the case of graphene channel, we find that the fitting from experimental data would yield a longer spin lifetime, which approaches its theoretical predicted value in graphene.

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Huazhou Wei
China University of Petroleum - Beijing

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