

## Quantum Analytical Theory for Giant Magnetoresistance in Magnetic Multilayered Cylindrical Systems

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**Abstract:** Taking into account the quantum size effects and considering three types of scattering from bulk impurities, rough surface and rough interfaces, we use quantum-statistical Green's function approach and Kubo theory to calculate the electronic conductivity and the giant magnetoresistance in magnetic multilayered cylindrical systems. It is found that in the limit of weakly scattering from impurities surface and interfaces, the total conductivity is given by a sum of conductivities of all the subbands and two spin-channels. For each subband and each spin-channel the scattering rate due to the impurities, surface and interfaces is added up.

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**Key words:** giant magnetoresistance, quantum size effects, rough surface scattering, rough interface scattering

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