第 9 回 CSIS セミナー
第 78 回ナノ・スピン工学研究会
半導体スピントロニクス研究室講演会の開催について

日　時：　平成 27 年 7 月 31 日（金）10:00-11:00

場　所：　電気通信研究所　ナノ・スピン総合研究棟 4 階　401 号室

講　師：　Dr. Igor Rozhansky (Ioffe Institute, St. Petersburg, Russia)

講演題目：Resonant indirect exchange interaction

概　要：

The talk will be focused on indirect exchange interaction between magnetic centers via a spatially separated 2D conducting channel. As the free 2D carriers are separated from the magnetic centers the indirect exchange is expected to be damped, however, a presence of a bound state at the magnetic centers can radically change the picture leading to an enhancement of the interaction. A simple theory of this phenomena will be explained with application to (Ga,Mn)As dilute magnetic semiconductor (DMS) heterostructure. The system considered contains InGaAs-based quantum well (QW) sandwiched between GaAs barriers with a Mn δ-layer located at a few nm from the QW. In our experiments the dependence of the Curie temperature on the QW depth exhibits a non-monotonous behaviour with a maximum related to the region of resonant indirect exchange as explained by the theory. In general, such heterostructures look very attracting for the DMS field. The holes concentration in the channel is not limited by the Mn concentration; this opens a way for new experimental and theoretical studies of ferromagnetism in DMS. Another interesting example of the resonant indirect exchange is an interaction between magnetic adatoms in graphene. The theory gives here some interesting results especially important from experimental point of view.

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問い合わせ先：WPI-AIMR　松倉（片平 5554）
電気通信研究所　大野研・佐藤（片平5553）