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# $Y_3Fe_5O_{12}$ 上の白金薄膜における界面に依存した磁気輸送現象

## Interface-dependent magnetotransport properties for thin Pt films on ferrimagnetic $Y_3Fe_5O_{12}$

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For study on spin-current phenomena, Pt|$Y_3Fe_5O_{12}$ (Pt|YIG) bilayers have been used frequently as a typical system. In the present presentation, we discuss interface-dependent magnetotransport properties in Pt|YIG at low temperatures using very thin (1.8-nm-thick) Pt films where the interface effect should be pronounced owing to the reduced Pt volume [1]. By conducting magnetotransport measurements in a wide temperature (0.46-300 K) and magnetic field (−15-15 T) region, we have shown that magnetoresistance and Hall effects at high magnetic-fields in Pt|YIG exhibit totally different behavior from those in conventional paramagnetic metals. As shown in Fig. 1(a), in the low-temperature regime where quantum corrections to conductivity are observed, weak antilocalization behavior observed in Pt films is critically suppressed when the film is attached to YIG. Hall resistance in the Pt film is also affected by YIG, and it exhibits nonlinear magnetic-field dependence at low temperatures, as shown in Fig. 1(b). These unconventional magnetotransport properties are prominent at low temperatures and at high magnetic-fields, which are clearly irrelevant to magnetization change in YIG.

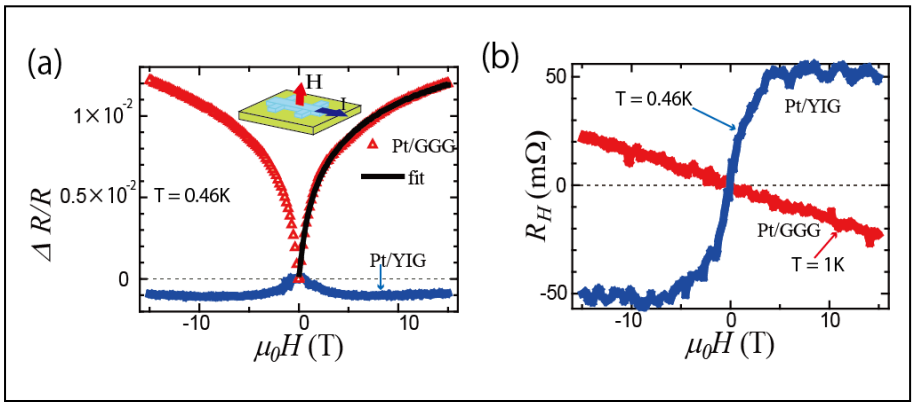


Fig.1: Magnetic-field dependence of (a) magnetoresitance and (b) Hall resistance. The solid line in (a) is the fit to weak antilocalization.

[1] Y. Shiomi, T. Ohtani, S. Iguchi, T. Sasaki, Z. Qiu, H. Nakayama, K. Uchida, and E. Saitoh, Appl. Phys. Lett. *in press.*