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Antiferromagnetic-domain-dependent magnetoresistance in Pt/$Fe_2Mo_3O_8$ interface TOSHIYA IDEUE, University of Tokyo, TAKASHI KURUMAJI, RIKEN Center for Emergent Matter Science (CEMS), SHINTARO ISHIWATA, University of Tokyo, YOSHINORI TOKURA, University of Tokyo, RIKEN Center for Emergent Matter Science (CEMS), UNIVERSITY OF TOKYO TEAM, RIKEN CENTER FOR EMERGENT MATTER SCIENCE (CEMS) TEAM — Interface between nonmagnetic metal and magnetic insulator has been extensively studied, exploiting a variety of new exotic spin transports. Among them, magnetoresistance in Pt/YIG interface attracts intense experimental and theoretical interest. The resistance of Pt layer reflects the magnetization of YIG in spite of the insulating nature of YIG, which has been explained by the spin current across the Pt/YIG interface or the magnetic proximity effect. So far, such anomalous magnetoresistance have been reported only in the interface between nonmagnetic metal and ferrimagnetic insulator. In this work, we have studied the transport properties of Pt on the antiferromagnetic insulator $Fe_2Mo_3O_8$. $Fe_2Mo_3O_8$ shows the metamagnetic phase transition under the magnetic field by which we can control the two different antiferromagnetic domains. Interestingly, transverse magnetoresistance in Pt/$Fe_2Mo_3O_8$ interface shows the distinct behaviors depending on the field cooling process which result in the different antiferromagnetic domains. This implies that the spin transport or proximity effect at the interface is different between two domains and can be probed by the resistance of nonmagnetic Pt.

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