

Estimation of Rashba parameter using in-plane field induced magnetoresistance

Won Young Choi^{1,2*}, Hyung-jun Kim¹, Joonyeon Chang¹, Suk Hee Han¹ and Hyun Cheol Koo^{1,2}

¹Center for Spintronics, Korea Institute of Science and Technology, Seoul 136-791, Korea

²KU-KIST Graduate School of Converging Science and Technology, Korea University, Seoul, 136-701, Korea

The Rashba spin-orbit interaction (SOI) in quantum well channel has great functional potential due to controllability by gate voltage, so it is discriminated from other systems. To quantify spin related phenomena in such a system, it is important to know exact strength of Rashba SOI. Usually Shubnikov-de Haas (SdH) oscillation is measured or potentiometric measurement using ferromagnetic contact at the center of channel is used to estimate the Rashba SOI parameter. In this research, we considered interaction between Rashba SOI field and in-plane magnetic field to observe strength of Rashba SOI. Measuring magnetoresistance induced by the interaction, we could obtain Rashba SOI parameters depending on gate voltage considerable to other methods.