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Spectroscopic Studies on epitaxially grown Fe/MgO/Fe magnetic tunnel junctions on W(100) TAE-YOUNG KHIM, JUN-SIK LEE, KEE-JEONG RHO, HOYOUNG JANG, BYEONG-GYU PARK, JAE-HOON PARK¹, Dept. of Physics, POSTECH, Korea, JAE-YOUNG KIM, HANGIL LEE², Beamline Research Division, PAL, Korea — In these days, there is a big interest in epitaxial Fe/MgO/Fe MTJ systems in the TMR issues. We investigated electronic states and magnetic behaviors of epitaxially grown Fe/MgO/Fe on W(100) at different MgO thicknesses using XAS, MCD, XPS, SRPES, and discussed a few noticeable phenomena in this system. First, XAS and MCD spectra at Fe $L_{2,3}$ -, O K -, and Mg K -edges varies as a function of MgO thickness. Second, in MgO/Fe/W(100), the magnetic hysteresis curve suddenly changes at a certain MgO layer thickness, probably due to a developed strain at the MgO/Fe interface. Finally, in Fe/MgO/Fe/W(100), an antiferromagnetic and a ferromagnetic interlayer coupling between two Fe ferromagnetic layers were observed for different MgO layer thicknesses, and we determined the spin polarization of the density of states.

¹corresponding author

²corresponding author

Jun-Sik Lee
Dept. of Physics, POSTECH, Korea

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