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Spin-dependent transport properties of threeterminal ferromagnetic-semiconductor heterostructures with a GaMnAs quantum well and double barriers: Control of quantum levels and TMR IRIYA MUNETA, Dept. of Electrical Engineering and Information Systems, The Univ. of Tokyo, Japan, SHINOBU OHYA, Dept. of Electrical Engineering and Information Systems, The Univ. of Tokyo, Japan, Japan Science and Technology Agency, Japan, MASAAKI TANAKA, Dept. of Electrical Engineering and Information Systems, The Univ. of Tokyo, Japan — We investigate the spin-dependent tunneling properties of three-terminal GaMnAs quantum-well (QW) double-barrier devices containing a QW electrode to control the spin-dependent quantum levels of the GaMnAs QW. We successfully modulate the quantum levels of the GaMnAs QW and control the spin-dependent current by changing the voltage of the QW electrode (V_{OW}) . Also, tunneling magnetoresistance increase is observed at resonant levels by changing V_{QW} . This work was partly supported by Grant-in-Aids for Scientific Research, the Special Coordination Programs for Promoting Science and Technology, R&D for Next-generation Information Technology by MEXT, and PRESTO of JST.

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