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Strong magnetoelectric effect in a Heusler alloy-based magnetic tunnel junction K. MOON, Dept. of Physics and IPAP, Yonsei Univ., Seoul 120-749 Korea & Dept. of Physics and Applied Physics, Yale Univ., New Haven, CT 06520, TAEWAN KIM, WANJUN PARK, Samsung Advanced Institute of Technology, P.O. Box 111, Suwon 440-600, Korea, JOONWON RIM, Dept. of Physics and IPAP, Yonsei Univ. — We study the magnetoelectric property of the magnetic tunnel junction(MTJ) formed between the half-metallic Heusler alloy and $CoFe$ exchange ferromagnet. The MTJ thus fabricated has demonstrated a large magnetoresistance increase for the anti-parallel spin alignment. Remarkably, the system exhibits a zero-bias current for the anti-parallel spin alignment, while it is absent for the parallel alignment. We argue that this manifests the strong magneto-electric coupling present in the MTJ, which is strongly enhanced by the half-metallic nature of Heusler alloy.

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