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Sign reversal of ac Josephson current in a ferromagnetic Josephson junction SHIN-ICHI HIKINO, MICHIIYASU MORI, SABURO TAKAHASHI, SADAMICHI MAEKAWA, Institute for Materials Research, Tohoku University — It is known that in a superconductor/insulator/superconductor (SIS) junction, when a finite voltage is applied, the Josephson current shows a logarithmic divergence, i.e., the so-called Riedel peak (RP) at the gap voltage, $V=2\Delta/e$, (Δ is a superconducting gap). In a double barrier Josephson junction such as SXS junction, on the other hand, the voltage dependence of I_c has not been investigated so far, where X is a normal metal (N) or a ferromagnet (F). We study the voltage dependence of Josephson critical current (I_c) in a variety of SXS junctions. In a SNS junction, I_c shows the RP at the gap voltage similar to a SIS junction. On the other hand, in a SFS junction, I_c shows a damped oscillation with the alternation of sign as a function of thickness (d) of F due to $0-\pi$ transition. The RP exhibits a strong dependence on d , and changes its sign. It is predicted that the RP disappears at the $0-\pi$ transition in the SFS junction.

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