

Abstract Submitted  
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**Temperature-Dependent Interlayer Couplings in Fe<sub>3</sub>Si/FeSi<sub>2</sub> multilayers prepared by facing targets direct-current sputtering** SHIN-ICHI HIRAKAWA, KEN-ICHIRO SAKAI, Kyushu University, KAORU TAKEDA, Fukuoka Institute of Technology, TSUYOSHI YOSHITAKE, Kyushu University, KYUSHU UNIVERSITY TEAM, FUKUOKA INSTITUTE OF TECHNOLOGY TEAM — Fe<sub>3</sub>Si (25 Å)/FeSi<sub>2</sub> (10 Å) multilayers were grown on Si(111) substrates by facing targets direct-current sputtering (FTDCS), and the interlayer coupling induced between the ferromagnetic Fe<sub>3</sub>Si layers were investigated at low temperatures. Antiferromagnetic (AF) coupling at room temperature was gradually weakened with a decrease in the temperature, and it finally became ferromagnetic (F) coupling or non-coupling at temperatures lower than 77 K. A reason for the change in the interlayer coupling should be due to the semiconducting FeSi<sub>2</sub> interlayers. We consider that the reduction in the carrier concentration with the decrease in the temperature gradually weakened the AF interlayer coupling and finally extinguished it.

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