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Point Contact Spin Spectroscopy of Ferromagnetic Fe3Si epitaxial Films Y.H. CHIU, Dept. of Phys., National Tsing Hua Univ., T.W. CHIANG, Dept. of Phys., National Taiwan Univ., S.Y. HUANG, S.F. LEE, Inst. of Phys., Academia Sinica, J. KWO, Dept. of Phys., National Tsing Hua Univ. — We report transport study of ferromagnetic Fe_3Si epitaxial films using point contact Andreev reflection technique. Fe_3Si is a ferromagnetic metal with a high Curie temperature of 840K and nearly lattice-matched to GaAs. The Heusler-like structure makes it a good candidate of half metals for spintronics. The observed spectra of Nb and NbTi / Fe_3Si point contacts using a Nb or NbTi etched tip are often broad, along with the presence of sharp dips at the superconducting Fermi energy possibly attributed to the proximity effect occurring at the interface of the contact. Using a modified Blonder-Tinkham-Klapwijk theory, the data analysis gave a spin polarization ranging from 27% to 47% under various contact conditions. The best-fit gave P= 41%, Z= 0.05, =1.49 meV at 2K. Since the thickness of our Fe_3Si samples are often small, current distribution effects in the probed layer are specially considered by varying the sample thickness.

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