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Local Valence Structure of Fe in Fe₃Si/GaAs(001) KUAN-LI YU, HSUEH-HSING HUNG, LING-YUN JANG, National Synchrotron Radiation Research Center, MING-WEI HONG, Department of Materials Science and Engineering, National Tsing Hua University, RAY NIEN KWO, Department of Physics, National Tsing Hua University — A high quality, epitaxial magnetic films of Fe₃Si on GaAs(001) substrates were studied in our experiment. Fe₃Si is ferromagnet and can be regarded as a Heusler-like alloy with a composition of Fe₂FeSi. There is possibility that Fe₃Si is a half metal which is an ideal candidate for spin injection, although the calculated density of states for bulk Fe₃Si does not predict half-metallic behavior. By using diffraction anomalous fine structure measurement, there is chance to look at the anomalous effect on the different atom sites. Two diffraction of Fe₃Si were measured as (002) and (004) to understand the local electron density structure in different Fe sites and the spectra show significant different features. By carefully handling these DAFS results, there is chance to understand the structure of the local density of state of the Fe atoms in different crystal sites.

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