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Spectra broadening in Point-Contact Andreev Reflection Measurement on GaMnAs SHANG-FAN LEE, T.W. CHIANG, Y.H. CHIU, S.Y. HUANG, Institute of Physics, Academia Sinica, Taipei, Taiwan, Republic of China, J.J. LIANG, Department of Physics, Fu Jen Catholic University, Taipei, Taiwan, Republic of China, H. JAFFRES, J.M. GEORGE, Unite Mixte de Physique CNRS/Thales and Universite Paris-Sud, Orsay, France, A. LEMAITRE, Laboratoire de Photonique et de Nanostructure, CNRS, Marcoussis, France — Point-Contact Andreev Reflection (PCAR) technique has been considered as a reliable method for determining electron spin polarization of novel metallic ferromagnets. For dilute magnetic semiconductors, this technique is less applicable due to the resistive nature of the material. We investigate PCAR spectra of $\text{Ga}_{0.94}\text{Mn}_{0.06}\text{As}$ using Pb tips. The observed spectrum exhibits behaviors described in the Modified Blonder-Tinkham-Klapwijk (MBTK) model but with a significant spectrum broadening. Modified BTK theory is commonly applied to analyze PCAR spectra with electron polarization, superconducting energy gap, and interface transparency as parameters. We present an analysis based on the introduction of spreading resistance and the inelastic scattering at the interface. In as-grown and annealed samples, we extract spin polarization of 76%/74% from our analysis, both smaller than the value obtained from approach of effective temperature³, 90%/82%.

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