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Spin injection from CoFe/MgO tunnel injectors into GaAs ROGER WANG, IBM Almaden Research Center and Stanford University, XIN JIANG, IBM Almaden Research Center , ROBERT SHELBY, IBM Almaden Research Center , SETH BANK, Stanford University, JAMES HARRIS, Stanford University, STUART PARKIN, IBM Almaden Research Center — The primary goal of research in spin injection has been to create a population of highly spin-polarized carriers inside a semiconductor at room temperature for potential manipulation in a spin-based device. Using quantum well electroluminescence detection, the CoFe/MgO tunnel spin injector has demonstrated greater than 50 % polarization of electrons inside GaAs at 100 K as well as polarizations exceeding 30 % at 290 K. In addition, the structures are thermally stable, showing no decrease in injected polarization even after exposure to temperatures as high as 400 ^{o}C. Both spin relaxation rate and recombination lifetime play a role in determining the measured polarization. The temperature and bias dependence of the polarization between 1.4 K - 290 K will be discussed.

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