

Abstract Submitted
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Fabrication of a Ferromagnetic Semiconductor Spin Bipolar Transistor MARK FIELD, BOBBY BRAR, BRIAN PIERCE, Rockwell Scientific, CHAD GALLINAT, DAVID AWSCHALOM, ART GOSSARD, JAMES SPECK, University of California Santa Barbara — We have fabricated a spin bipolar transistor that uses a bilayer of the ferromagnetic semiconductor $\text{Ga}_{(1-x)}\text{Mn}_{(x)}\text{As}$ to provide a tunneling magnetoresistance (TMR) element in the emitter of the device. The two magnetic layers have a different manganese concentration that gives differing coercive fields and Curie temperatures. This allows the two magnetic layers to be set in parallel or anti-parallel configurations at low temperatures. TMR is clearly observed, and transistor action confirmed in the electrical characteristics of the device.

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