Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Low Temperature Differential Conductance in Al/AlOx/Sc Tunnel Junctions SHENG-SHIUAN YEH, JUHN-JONG LIN, Institute of Physics, National Chiao Tung University, Hsinchu 30010, Taiwan — We have fabricated several Al/AlO_x/Sc tunnel junctions and measured the differential conductances $G \equiv dI/dV$ at low temperatures. Our objective is to study the effect of the coupling between tunneling electrons and localized magnetic impurities (which sat in the insulating barrier) on $G(V,T)$. We observed a crossover from the weak coupling regime to the strong coupling regime. We found that, in both regimes, the dI/dV spectra could be well described by the Appelbaum's *s-d* exchange interaction theory, with a Kondo temperature $T_K^{Appelbaum} \approx 34.8$ K. On the other hand, our measured zero-bias conductances could be well described by a scaling form predicted by the NRG calculations and a $T_K^{NRG} \approx 38$ K was deduced, being in close agreement with the value of $T_K^{Appelbaum}$. A magnetic field of 4 T was applied at 2.5 K, but no Zeeman splitting in the dI/dV spectra was observed. This absence of Zeeman splitting resulted as a consequence of the high T_K value found in our junctions.

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Date submitted: 27 Nov 2007 Electronic form version 1.4