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Low Drift in Resistance of Plasma Oxidized, Cobalt Confined AlOx Tunnel Barriers Z. S. BARCIKOWSKI, Y. HONG, J. M. POMEROY, National Institute of Standards and Technology — Co/AlOx/Co tunnel junctions show <15% drift in resistance measured over the first three months. This long term stability is achieved using plasma oxidation and sandwiching the AlOx tunnel barrier between cobalt layers. Plasma oxidation of aluminum, when compared to thermal oxidation, has been shown to produce a more homogeneous and stoichiometric oxide. The confinement of the oxide between Co layers, which have higher oxide enthalpies of formation, is thought to provide a barrier against oxygen diffusion. Junction resistance and current-voltage (I-V) measurements are taken over a period of approximately 9 months. Barrier width (s) and asymmetric barrier heights (φ_1, φ_2) are extracted using Simmons/Chow transport model. Bottom barrier height (φ_2) and barrier width (s) show near constant values in contrast to a rise in top barrier height (φ_1) in time.

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