Abstract Submitted for the MAR08 Meeting of The American Physical Society

RF Assisted Spin Transfer Switching in Nanopillar Spin-Valves S.H. FLOREZ, J.A. KATINE, M. CAREY, L. FOLKS, O. OZATAY, B.D. TERRIS, Hitachi Global Storage Technologies, San Jose Research Center, 3403 Yerba Buena Road, San Jose CA 95135 — We study at low temperature spin transfer torque (STT) driven free-layer magnetization reversal in current perpendicular to plane (CPP) spin values with in-plane magnetization. The precessional frequencies of the direct current driven pre-switching modes were measured. Based on this characterization we compare the pre-switching and switching behavior, when driven by direct currents only and in the presence of an additional rf current bias. We find interesting rf induced dynamics such as frequency locking as well as effects on the critical switching boundary. These effects appear for applied frequencies close to the dc-only driven pre-switching resonance frequencies. In particular, we observe a reduction in the critical current for switching when applying rf with frequencies slightly below this range. Macrospin simulations (using Slonczewski STT) reproduce well our experimental data and serve as a basis for the development of a phenomenological model that describes the observed behavior.

> B. D. Terris Hitachi Global Storage Technologies, San Jose Research Center, 3403 Yerba Buena Road, San Jose CA 95135

Date submitted: 19 Nov 2007

Electronic form version 1.4