

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Nanomagnetic triangles for a non-volatile logic applications<sup>1</sup>**

ALEXANDER KOZHANOV, University of California Santa Barbara, S. JAMES ALLEN, University of California at Santa Barbara — Single domain triangular nanomagnet is a base element in the recently proposed non-volatile logic application [1]. Dependent on the triangle shape and dimensions “Y” or “buckle” magnetization alignment ground states are defined by configurational anisotropy. In the “Y” ground state the local magnetization is aligned to point either towards or away from the triangle vertexes. The three triangle vertexes are used for information storage while switching between different ground states performs logic operations. In this work we study nanomagnetic triangle ground states and switching between them using micromagnetic simulations. We show that triangle shape engineering within the fabrication method tolerance allows maintaining the “Y” ground state despite the shape distortions typical for fabrication process. We correlate the height and profile of the energy barrier between the triangle ground states with the triangle shape and dimensions. We discuss ground state switching mechanisms and assess the triangle use for non-volatile logic and memory applications.

[1] A. Kozhanov, C.J. Palmstrom, S.J Allen “Spin Torque Triad for a non-volatile logic gates” US Patent pending.

<sup>1</sup>Supported by Nano Electronics Research Corporation via the Nanoelectronics Research Initiative at the Western Institute of Nanoelectronics Center

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Date submitted: 13 Dec 2011

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