Abstract Submitted
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Ballistic (precessional) contribution to the conventional magnetic switching[1] ANDRZEJ STANKIEWICZ, NVE Corporation, YA. B. BAZALIY[2], SHU YAN, University of South Carolina — We consider a magnetic moment with an easy axis anisotropy energy, switched by an external field applied along the axis. Additional small constant bias field is applied perpendicular to the axis. It is found that the magnet's switching time is a non-monotonic function of the rate at which the field is swept from "up" to "down". Switching time exhibits a minimum at a particular optimal sweep time. This unusual behavior is explained by the admixture of a ballistic (precessional) rotation of the moment caused by the perpendicular bias field in the presence of a variable switching field. Analytic approximations are derived for the dependence of the switching time on the field sweep rate and for the value of the optimal field sweep time. The existence of the optimal field sweep time has important implications for the optimization of magnetic memory devices.

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