

Racetrack Memory!

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A novel storage-class memory is described in which magnetic domains are used to store information in a “magnetic race-track” [1]. The magnetic race-track promises a solid state memory with storage capacities and cost rivaling that of magnetic disk drives but with much improved performance and reliability: a “hard disk on a chip”. The magnetic race track is comprised of tall columns of magnetic material arranged perpendicularly to the surface of a silicon wafer. The domains are shifted up and down the race-track by nanosecond long pulses of spin polarized current using the phenomenon of spin momentum transfer. We discuss recent results on the current and field induced dynamics of domain walls in permalloy nanowires [2-5] which makes the Racetrack possible and demonstrate the first current controlled domain wall shift register [6].

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