Abstract Submitted
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A magnetic-field-effect transistor and spin transport.[1] R.N. GURZHI, A.N. KALINENKO, A.I. KOPELIOVICH, A.V. YANOVSKY, Institute for Low Temperature Physics and Engineering, Lenin ave. 47, Kharkov 61103, Ukraine, E.N. BOGACHEK, UZI LANDMAN, School of Physics, Georgia Institute of Technology, Atlanta, Georgia 30332-0430 — A magnetic-field-effect transistor is proposed that generates a spin-polarized current and exhibits a giant negative magnetoresistance. The device consists of a nonmagnetic conducting channel (wire or strip) wrapped, or sandwiched, by a grounded magnetic shell. The process underlying the operation of the device is the withdrawal of one of the spin components from the channel, and its dissipation through the grounded boundaries of the magnetic shell, resulting in a spin-polarized current in the nonmagnetic channel. The device may generate an almost fully spin-polarized current, and a giant negative magnetoresistance effect is predicted. [2]

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[2]R.N. Gurzhi et al., Appl. Phys. Lett. **83**, 4577 (2003).

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