Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Vortex manipulation in S/F hybrid nanosystems VICTOR V. MOSHCHALKOV, INPAC-K.U.Leuven, Belgium, ALEJANDRO SILHANEK, WERNER GILLIJNS, ALEXEI ALADYSHKIN, NIELS VERELLEN, INPAC TEAM — Tunable field-induced superconductivity has been observed in superconducting films with a periodic array of magnetic dots with magnetization which is varied by using different hysteresis cycles to magnetize the dots. As a result, the shift of the Tc(H) curve to higher fields of a certain polarity ("magnetic bias") can be controlled by tuning the strength of the field emanating from the dots and compensating the applied field. Static vortex patterns and dynamic effects, such as guided vortex motion and vortex ratchet effects, were studied in the superconductor/ferromagnet hybrids consisting from the superconducting film covered by magnetic dots, bars, loops with the in-plane magnetization. In-plane magnetic dipoles create asymmetric pinning sites responsible for the appearance of the magnetic dipole vortex ratchets theoretically predicted by Carneiro and now found experimentally. Switchable flux pinning landscape has been created by tuning the magnetic states of the in-plane magnetized loops (Phys.Rev.Lett. **98**, 117005 (2007), Appl. Phys. Lett. **90**, 182501 (2007), Phys. Rev. B (R) **76**, 60503 (2007))

Victor V. Moshchalkov
INPAC-K.U.Leuven

Date submitted: 03 Dec 2007 Electronic form version 1.4