Abstract Submitted
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Fabrication and characterization of lateral all-magnetic superlattices[1] NIKOLAY POLUSHKIN, STEVEN MICHALSKI, LANPING YUE, ROGER KIRBY, Department of Physics and Astronomy, University of Nebraska-Lincoln, 68588-0111, Lincoln, NE, FAST MAGNETIZATION DYNAMICS LABORATORY TEAM — Conventionally, patterned magnetic elements produced by lithographic methods are surrounded by nonmagnetic spacers. We describe a technique for *direct laser fabrication* of 1D and 2D superlattices composed of two different magnetic materials with *variable* properties. The approach is based on the phase transformations induced locally by interfering laser beams in thin alloyed layers of transition metals (Fe-V, Fe-Cr, Co-Pt). Using magnetic force microscopy and methods of magnetometry, we demonstrate that the structures patterned even in the submicron regime possess significant contrast in the magnetizations, with sharp interfaces between the constituents. We have used time-resolved magneto-optical Kerr effect measurements to further characterize the magnetic properties of these samples. These data allow us to obtain the magnetizations and gyromagnetic ratios of the constituents. Possible application to microwave nanophotonics of such all-magnetic superlattices with *tunable* magnonic band gaps is briefly discussed.

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Nikolay Polushkin

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