Abstract Submitted
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Metamaterials with tunable refractive index fabricated from amorphous ferromagnetic microwires and optical Magnus effect[1] ANDREY IVANOV, ANATOLY VEDYAYEV, VLADIMIR GALKIN, ALEXANDER SHALYGIN, VALERY IVANOV, M.V. Lomonosov Moscow State University — For homogeneous NPVM (negative phase–velocity mediums) [V. G. Veselago, Soviet Physics - Uspekhi **10** (1968) 509; T. G. Mackay, A. Lakhtakia, Phys. Rev. E **69** (2004) 026602] anomalous effects such as negative refraction, light pressure, Doppler shift, Cherenkov-Vavilov radiation, *Goos − Hänchen* effect have been discovered in different frequency ranges. In this presentation the optical circular polarized effect is calculated for inhomogeneous mediums (optical Magnus effect) and it is shown that it is anomalous in NPVM with respect to "right-handed" materials. The proposed metamaterials fabricated from glass coated amorphous ferromagnetic Co-Fe-Cr-B-Si microwires are shown to exhibit a negative refractive index for electromagnetic waves over scale of GHz frequencies [A.V. Ivanov, A.N. Shalygin, A.V. Vedyayev, V.A. Ivanov, JETP Letters **85** (2007) 565]. The magnetostatic interaction between microwires has been taken into account. The phase and group velocities in proposed metamaterial have been calculated. The ratio of thereof depends monotonically on the size of the microwires. Optical properties of such metamaterials are tunable by an external magnetic field and mechanical stress.

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