Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Negative Refractive Index Materials for Optical Range of Spectrum VLADIMIR SOBOLEV, South Dakota School of Mines and Technology, Rapid City, SD 57701, VALERII ISHCHUK, Science Technology Center Reaktivelektron, of the National Academy of Sciences of Ukraine, Dontesk, Ukraine — A new method of manufacturing of negative refractive index media is presented. It is demonstrated that one can use of the controlled decomposition of solid solutions of oxides with perovskite crystal structure in the state of coexisting domains of the antiferroelectric and ferroelectric phases for manufacturing of such materials. The lead zirconate titanate based solid solutions are considered as an example of substances suitable for creation of such materials. Manufactured composites constitute a dielectric antiferroelectric matrix with a structure of conducting interphase boundaries separating domains of the ferroelectric and antiferroelectric phases. The electric conductivity of the interphase boundaries occurs as a result of the local decomposition of the solid solutions in the vicinity of these boundaries. The decomposition process and consequently the conductivity of the interphase boundaries can be controlled by means of external influences.

Vladimir Sobolev
Department of Physics, South Dakota School of Mines and Technology, Rapid City, SD 57701

Date submitted: 06 Nov 2015 Electronic form version 1.4