Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Possibilities of Verifying Dynamical Casimir Effect with Nonlinear Materials in Microwave Cavities VIKTOR DODONOV, Institute of Physics, University of Brasilia — I evaluate the number of "Casimir quanta" that could be created in high-quality electromagnetic cavities containing materials with big third-order nonlinear optical coefficients, due to the parametric amplification of the microwave vacuum field, if the effective refractive index of the material is modulated by periodic high-intensity short laser pulses. The main result is that the expected total number of created microwave photons depends neither on the laser beam shape, nor on the duration or power of individual pulses, but it is determined by the total energy of all pulses, provided the duration of each pulse is much shorter than the period of field oscillations in the selected resonant mode. The experiment can be feasible in small cavities with high resonance frequencies. Possible spurious effects will be discussed, too.

Viktor Dodonov
Institute of Physics, University of Brasilia

Date submitted: 09 Nov 2014 Electronic form version 1.4