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Generation, manipulations and applications of squeezed vacuum in optically dense Rb vapor

IRINA NOVIKOVA, College of William and Mary

Harnessing quantum mechanical properties of light opens up exciting possibilities for quantum information and precision metrology. In this talk I will discuss the generation of non-classical “squeezed” optical vacuum field using a rubidium vapor cell as a nonlinear medium, and the polarization self-rotation effect as the squeezing nonlinearity. I will also describe some methods for squeezed vacuum manipulations based on coherent optical effects, as well as possible applications for quantum-enhanced measurements and information technologies.