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Polarization Squeezing in Atomic Rubidium Vapour GEOFF CAMPBELL, CHRIS HEALEY, JURGEN APPEL, KARL-PETER MARZLIN, ALEX LVOVSKY, Institute for Quantum Information Science — Recently there has been debate regarding the possibility of using polarization self-rotation (PSR) in a thermal vapour cell as a mechanism for generating a squeezed vacuum state [1,2]. It has been claimed that the squeezing produced by this method is overwhelmed by atomic noise in the thermal vapour [2]. We present a new experimental study on the possibility to generate squeezing in this system and theoretical results that highlight the importance of the atomic ground state decoherence.

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[2] M. T. L. Hsu, G. Hetet, A. Peng, C. C. Harb, H.-A. Bachor, M. T. Johnsson, J. J. Hope, P. K. Lam, A. Dantan, J. Cviklinski, A. Bramati and M. Pinard, Phys. Rev. A 73, 023806 (2006).

Geoff Campbell
Institute for Quantum Information Science

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