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Enhancing optical densities in thermal micro-cells on demand FABIAN RIPKA, MAXIM LEYZNER, HARALD KUEBLER, ROBERT LOEW, TILMAN PFAU, 5. Institute of Physics, University of Stuttgart — Thermal atom cells on the size of few micrometers are powerful devices in the realm of fundamental as well as applied research in atom-optics. To provide enough atoms in such small volumes, usually temperatures much larger than 300K have to be applied. However, this is accompanied with enhanced collisional effects and the excitation of surface-polaritons as well as technical difficulties in the experimental setups due to large temperature gradients. We present an experimental approach exploiting the effect of light-induced atomic desorption [1], similar to the work of [2]. Here atoms are desorbed from the glass surface via intense ns-pulses at 480 nm and contribute to the optical density of the cell, until they adsorb at the opposite window surface and get bound again. By this technique we trigger the number of atoms to many hundreds per cubic micrometer on ns timescale. We will report on systematic time-resolved optical measurements in a thermal rubidium micro-cell. We show possible applications and remaining questions to be answered. [1] Meucci et al., EPL 25, 639 (1993) [2] Atunov et al., Phys. Rev. A 67, 053401 (2003)

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