

Ultracold Plasma and Rydberg atoms in a Magnetic Field

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Our simulations of molecular dynamics show that magnetic field can strongly reduce of the recombination plasma rate [1]. The variation of recombination rate can be change by several orders to compare with magnitude of the recombination rate at $B = 0$. We assembled setup for preparation and study of ultracold lithium plasma by using tunable lasers [2]. Behavior of laser cooled plasma in external magnetic fields will be investigated. Our studies of ultracold plasma in magnetic field were initiated by opportunity to control laser cooled plasma and possibility to increase a production of anti-hydrogen atoms from cold antiprotons and positrons also for quantum computers. This work was supported by grants from the Program for basic research of the Presidium of the Russian Academy of Sciences Study of matter under extreme conditions under the guidance of Academic Fortov V.E., President Grant of Russian Federation MK-4092.2014.2, Russian Fundation of Basic Research Grant 14-02-00828.

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[2] B. B. Zelener, , S. A. Saakyan, V. A.Sautenkov, et al., *JETP Letters* **98**, 11, 670 (2014)