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Experimental setup of ultracold Rydberg atoms CHUYANG SHEN, CHENG CHEN, XIAOLING WU, YUE CUI, SHEN DONG, State Key Laboratory of Low Dimensional Quantum Physics, Department of Physics, Tsinghua University, MENG KHOON TEY, LI YOU, State Key Laboratory of Low Dimensional Quantum Physics, Department of Physics, Tsinghua University; Collaborative Innovation Center of Quantum Matter — Strong interaction between Rydberg atoms makes them ideal systems for quantum information processing and quantum simulation. In this poster, we will report our recent progress on constructing a machine for trapping ultracold rubidium atoms in their Rydberg states. For good optical, our system has two main science chambers: a MOT chamber and a Rydberg chamber. We use a moving optical tweezer to move atoms from the MOT chamber to the Rydberg chamber over 22 cm, achieving a transfer efficiency of 70%. A two-color laser system used for exciting the atoms to the Rydberg states would be discussed. A microscope setup featuring an aspheric lens placed in the Rydberg chamber for site-resolved detection would also be shown.

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