Abstract Submitted
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A new apparatus for quantum simulation with ultracold dipolar erbium atoms[1] BOJEONG SEO, ZITING CHEN, YEEMING TSO, WEIJUN YUAN, PENG CHEN, SHENWANG DU, GYU-BOONG JO, Hong Kong University of Science and Technology — Recently Lanthanide atoms such as dysprosium and erbium have attracted significant attention in quantum simulation with ultracold atoms due to their large magnetic moment and meta-stable excited states. Here, we present our on-going efforts for developing a versatile erbium apparatus in which various exotic states of matter, such as quantum droplets, can be emulated. Slow erbium atoms generated by a spin-flip Zeeman slower are trapped by a magneto-optical trap (MOT). We implement a bi-chromatic MOT, consisting of singlet ($4f^{12}6s^2\ ^3H_6 \rightarrow 4f^{12}(^3H_6)6s6p(^1P_1)$) and triplet ($4f^{12}6s^2\ ^3H_6 \rightarrow 4f^{12}(^3H_6)6s6p(^3P_1)$) transitions, which increases the repetition rate of experiment. We will discuss experimental details that produce a degenerate quantum gas of erbium atoms in the apparatus.

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