Contribution ID: **7** Type: **Poster**

Jiajun Chen, Yijun Tang

Thursday 4 April 2024 16:50 (2 hours)

The AION detector requires the delivery of ultracold strontium with a fast repetition rate and large atom number, at the lowest possible temperatures. We will report on our recent progress in developing simulations and experimental techniques for efficient cooling and transport of strontium atoms. Our transport scheme is based on focus-tuneable lenses to dynamically control the focus size and position of a single-beam optical dipole trap, moving pre-cooled strontium clouds into the interferometry chamber. One feature of this scheme is that the focus size can be maintained over the transport process, providing a uniform trapping condition but with independent tuning of the trap size when required. We aim to minimise heating and atom loss during this process by utilising custom low-noise drive electronics with feedback for stabilisation, and choosing a careful acceleration and intensity profile for the transport beam. To provide insight into experimental parameters, we carry out simulations in AtomECS, an open-source cold atom simulation platform. We simulate the loading of a crossed-beam dipole trap from a red MOT, then loading of the single-beam dipole trap for optical transport. We use these to investigate optimal parameters for each loading stage and the acceleration profile of the optical transport ramp.

Poster Abstract

Session Classification: Poster Session & Wine & Coffee