

Sensing interactions in atomic quantum systems

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Experiments that cool, trap, and control atoms, ions, and molecules provide a unique testbed. Hybrid ion-atom systems combine the well-controllable platforms of trapped ions and ultracold quantum gases and link them together by the intermediate-range ion-atom interaction. These quantum systems offer opportunities for buffer gas cooling, quantum simulation of many-body systems as well as for state-to-state quantum chemistry [1]. To fully benefit from the combination, it is essential to understand, characterize, and control the interactions between the atoms and ions. Therefore, at TU/e a new experimental setup is being build which combines a trapped ion – Yb^+ - with dipolar atoms - Dy. This poster reports on the development of its design and how it can be used to sense interactions in these atomic quantum systems.

References

- [1] R.S. Lous and R. Gerritsma, AAMOP, 71 (2022) 65-133

Figures

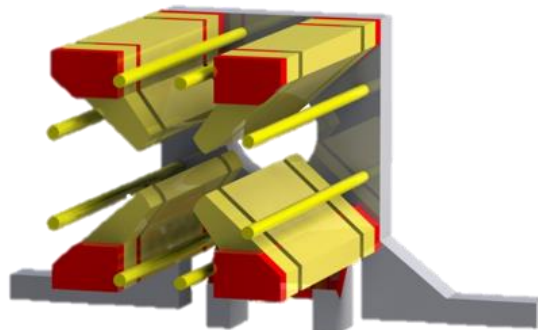


Figure 1: CAD drawing of the ion trap design.
