Design of a New Apparatus for Dipolar Quantum Gases Strongly Coupled to Cavity QED

D. Robledo de Basabe[*1], **J. Seifert** [1], **M. Duerbeck** [1], **N. Werum** [1], **G. Meijer** [1], **G. Valtolina** [1].

1. Fritz-Haber-Institut, Max-Planck-Gesellschaft, Faradayweg 4-6, 14195 Berlin

Strong light-matter coupling can be used for exploring exotic quantum many-body phases, arising from the competition between dipolar and light-mediated long-range interactions, as well as for attaining control of chemical reactions. At the Fritz Haber Institute, we are designing a new apparatus for studying ultracold dipolar atoms and molecules strongly coupled to a cavity QED. We report on our efforts to create a quantum gas of dysprosium atoms in a preliminary version of the apparatus.

[*]robledo@fhi-berlin.mpg.de