SFB/TRR 21 - Seminar
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Manuel Mielenz
(Universität Würzburg)

Trapping of Polar Molecules in a Microstructured Electrical Trap

In the previous years much effort was put in the development of sources of (ultra-)cold molecules. A promising method to produce sub-mK samples of a wide range of molecules ist optoelectrical cooling. This Sisyphos-type laser-cooling scheme uses the strong interaction between polar molecules and an electrial field to dissipate energy, whereas the scattering of photons is used only to remove entropy.
A central element towards the realisation of this scheme is a suitable trap for polar molecules. It is required, that the lifetime of the molecules in the trap is suffciently high and the trap volume is devided into two parts with homogeneous fields of different strength in each part. These requirements are met by a novel trap design: The homogeneous fields are induced by two pairs of capacitor plates. The confinement of the molecules in the trap volume is ensured by high electrical fields enclosing the volume. Microstructuring the plates and a ring electrode surrounding them provide those fringe fields.
In the context of the work, the trap has been set up and characterised. The principle of the trap has been proven, with molecules being trapped for several seconds. This constitutes an important step towards the realisation of optoelectrical cooling.

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Universität Stuttgart, NWZII, Raum 3.123
Pfaffenwaldring 57, 70569 Stuttgart

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