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**Photodissociation of SO<sub>2</sub> as a way to cold atoms and molecules** LISDAT CHRISTIAN, Physikalisch-Technische Bundesanstalt, Braunschweig, Germany, OLEG BUCICOV, MARCIN NOWAK, SEBASTIAN JUNG<sup>1</sup>, EBERHARD TIEMANN, Institute of Quantum Optics, Leibniz University Hannover, Germany — We discuss the possibility to use the photodissociation of cold SO<sub>2</sub> molecules to produce internally and translationally cold photofragments SO and O. It is expected from our measurements of the molecular Stark effect [1] that the dissociation pathways and excess energies of the fragments are tunable by electric fields [2]. Cold SO<sub>2</sub> molecules are produced by Stark deceleration. We have realized a Stark decelerator that is able to slow down packages SO<sub>2</sub> in weak-field seeking levels to a few 10 m/s center of mass velocity. A Stark decelerator with 326 stages is required for this purpose, since the ratio of Stark shift to initial kinetic energy is small for SO<sub>2</sub>. The photofragments SO and O have triplet ground states, while the ground state of SO<sub>2</sub> is diamagnetic. In combination with the photodissociation at the threshold we want to employ this constellation to accumulate fragments in a magnetic trap by dissociating SO<sub>2</sub> as it is stopped by electric fields in the center of the trap.

[1] J. Phys. B **39**, S1085 (2006).

[2] Phys. Rev. A **74**, 040701(R) (2006).

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