## Abstract Submitted for the MAR08 Meeting of The American Physical Society

Photodissociation of  $SO_2$  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  $SO_2$  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  $SO_2$  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  $SO_2$ . The photofragments SO and O have triplet ground states, while the ground state of  $SO_2$  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  $SO_2$  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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Date submitted: 25 Nov 2007

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