# MO 33: Poster: Various Topics

Time: Thursday 16:00–18:00 Location: P1

MO 33.1 Thu 16:00 P1

**Electric field induced dissociation of high Rydberg states in $H_3$** — •Peer Fechner, Hannes Höffler und Hanspeter Helm — Physikalisches Institut, Albert-Ludwigs-Universität Freiburg

Due to its simple structure, neutral $H_3$ qualifies as a model-system for observations of intramolecular dynamics, one focus being the decay of the molecule into three single 1s hydrogen atoms initiated by nonadiabatic coupling. Using triple-coincidence techniques the temporal and spatial information of the three fragment atoms are collected and the center-of-mass momentum-vector correlations of the fragments, which are encoded in so-called Dalitz plots, are deduced. This provides direct insight into the effects of nonadiabatic coupling. The topic is currently studied in molecular dynamics calculations [1,2]. Here we present recent results on the 3-body-decay of high Rydberg states in $H_3$ [3]. This decay can be enhanced by an external electric field. We find that the Dalitz plots rapidly change with electronic energy in the Rydberg series. In the immediate vicinity of the ionization threshold we observe a preferred dissociation into a nearly linear configuration, where in the center-of-mass frame one atom stays at rest while the remaining two gain opposite momenta. We compare our finding with observations by Strasser et. al. [4] who studied dissociative recombination of cold $H_3^+$ ions with slow electrons. Research supported by DFG HE 2525/5.

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[2] M. Lehner and M. Jungen, J. Phys. B 42, 065101 (2009)
[3] P. Fechner and H. Helm, Phys. Rev. A 82, 052523 (2010)
[4] D. Strasser et al., Phys. Rev. A 66, 032719 (2002)