

*Abstract for invited talk*

## **Differential Studies of Positron Impact Ionization**

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Differential studies are an important probe of collision dynamics. In a previous study, the occurrence of the electron-capture-to-the-continuum (ECC) for 50eV positron impact ionization on H<sub>2</sub> was investigated [1,2,3]. The possible origins of an observed energy shift between the experimental data and a theoretical distribution have now been investigated. In this study, two targets have been considered at the same final state energy. Molecular deuterium has been used to establish whether at this energy ionization is significantly accompanied by dissociation of the remnant ion. A helium target has also been employed to eliminate possible contributions from molecular excitations. Both electron spectra for D<sub>2</sub> and He have been found to be shifted as for the molecular hydrogen by ~ 1.6eV. In order to understand the energy discrepancy, the scattered positron projectiles have also been energy analysed. The results clearly reveal unexpected asymmetries in the sharing of the residual kinetic energy between ejected electron and scattered positron. Results will be presented at the conference.

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Abstract for poster

## Positron Impact Ionization of H<sub>2</sub>O

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The cross-sections for ionization and fragmentation of water are relevant in radiation damage and in the chemistry of planetary atmosphere. However, whilst a considerable body of data for electron-water cross-sections is available for a variety of processes [e.g. 1], data for positron-water cross-sections are very scarce [2, 3]. In fact, experimentally, they are limited to a single total cross-section determination [2] and an indirect estimation of the cross-section for Ps formation that suggested anomalously low values [4]. We have now added to the available data library through direct measurements of the total- and direct-ionisation cross-sections. From these, following the method of [5], the positronium formation cross-section has also been determined. Finally, the doubly differential ionization cross-section is also being measured. Results will be presented at the workshop.

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