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Progress towards a positron trap at SMI

A positron trap is a powerful and adaptable tool for performing experiments with positrons and positronium. These devices use a strong magnetic field, a stepped potential well and Nitrogen and CF4 buffer gas. Positrons are initially trapped via the electronic excitation of N2, CF4 is added for efficient cooling via vibrational and rotational excitations. This type of positron trap can typically produce ˜105 e+/s in bunches with a diameter of 1-2 mm and an energy spread of approximately 50 meV [e.g. 1,2].
We aim to use the positron pulses from such a trap to observe molecules containing positronium, such as PsH [3] and PsO [4] via collisions in gases such as methane and carbon dioxide. By using a high mass resolution ion spectrometer to detect fragments from dissociation, precise measurement of their binding energy will be performed.
This poster will describe the progress on the construction of the positron beamline, trap, and ion spectrometer under construction at the Stefan Meyer Institute in Vienna.
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Scientific topic

Symmetries

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