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A kinematically complete experiment for positron impact ionization of helium at the positron beam facility NEPOMUC A. DORN, M. HOLZWARTH, TH. PFLUEGER, A. SENFTLEBEN, X. REN, J. ULLRICH, Max Planck Institute for Nuclear Physics, L. HARGREAVES, B. LOHMANN, Centre for Antimatter-Matter Studies, University of Adelaide, D. SLAUGHTER, J. SULLIVAN, J. LOWER, S. BUCKMAN, Center for Antimatter-Matter Studies, Australian National University, H TEAM, A TEAM, C TEAM — In the project presented ionizing collisions of positrons with simple atoms and molecules will be explored in unprecedented detail. By combining presently available high-intensity positron sources with an efficient multi-particle imaging spectrometer (reaction microscope) fully differential benchmark cross sections (FDCS) will become available to critically test theory and to advance our understanding of few-body quantum dynamics. Here the results of a pilot experiment on positron impact ionization of helium at the NEPOMUC positron beam facility are presented. Momentum distributions of the ionized electron and the scattered projectile along the incoming projectile beam axis are presented for $E_0 = 80$ eV and compared to respective electron impact results. For positron impact the electron momentum distribution is shifted significantly forward compared to the electron impact case indicating the reversed post-collision interaction in both cases. In future FDCS will be obtained also at the Australian Positron Beamline Facility.

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