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## PIPE: The Photon-Ion-Endstation at PETRA III for Experimental Studies of XUV-Photoprocesses in Small Quantum Systems

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This contribution features the user facility PIPE which is a permanent end station at the Variable Polarization XUV beamline P04 at PETRA III / DESY for the study of photon interactions with matter in the gas phase (charged and neutral atoms, molecules, clusters). The setup provides flexible state-of-the-art experimental equipment such as specialized ion sources, an ion trap, and particle spectrometers with multiple coincidence capabilities. Since the start of operation in 2013, already several research highlights have been published, e.g., the quantitative study of a genuine four-electron process induced by resonant inner shell excitation of an atomic ion [Phys. Rev. Lett. 114, 013002 (2015)], the observation of a two-particle interference of electron pairs in a molecule [Phys. Rev. Lett. 117, 083002 (2016)], the imaging of the square of a correlated two-electron wave function in a molecule [Nature Communications 8, 2266 (2017)], or the determination of the probability for direct double ionization of an atomic anion by a single photon over a wide photon energy range [Phys. Rev. Lett. 120, 133202 (2018)]. The construction and building of the PIPE setup has been made possible by substantial funding from the German Ministry for Education and Research (BMBF) within the “Verbundforschung” funding scheme under contracts 05KS7GU2, 05KS7KE1, 05KS7RF2, 05KS7RG1, 05K10GUB, 05K10KEA, 5K10RF2, 05K10RG1, 05K13GUA, 05K16GUC, 05K16RF3, 05K16RG1.

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