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Positronium – Helium Scattering at Low Energies.¹ JASON ENG-BRECHT, St. Olaf College — Recently we have completed a long term effort to utilize a Doppler broadening technique to observe positronium thermalization in a Helium gas, and extract information on the momentum-transfer cross section for this interaction. Simultaneous acquisition of lifetime and Doppler broadening data allowed for dramatic improvements to statistical and systematic source of error. These improvements allowed the precision of the experiment to be improved by a factor of 5 over previous Doppler experiments and extended the observable energy range down to thermal energies. Our results also demonstrate the first experimental evidence of an energy dependent cross section. Finally, we will discuss future directions for study of positronium-atom interactions.

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Jason Engbrecht St. Olaf College

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