

## Near threshold ionization of argon by positron impact

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Historically, positron impact ionization has been investigated using beams of positrons with extremely large energy spreads ( $\Delta E \sim 2\text{eV}$ ). The development of trap-based positron beams has for the first time allowed routine measurements with thermal energy spreads [1]. In this work, the cross-section for positron impact ionization of argon has been studied with a high-resolution positron trap-based beam ( $\Delta E \sim 60\text{meV}$ ). A new method has been developed to measure the electron yield from ionization allowing the very near threshold ( $E_i + 2\text{eV}$ ) region to be investigated [2].

In this region close to threshold, the ionization process should be well understood via the so-called Wannier threshold law. These first results show that the exponent of the power law deviates from those predicted by theory and is close to that for electron impact ionization [3]. At present, this observation is not understood, work continues with other targets to test the robustness of this finding.

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[1] Sullivan, J. P., A. Jones, P. Caradonna, C. Makochekanwa, and S. J. Buckman, *Rev Sci Inst* **79**, 11 (2008)

[2] J. R. Machacek, T. J. Babij, D. J. Murtagh, S. Buckman, and J. P. Sullivan, *Euro. J. Phys. D*

[3] T. J. Babij, J. R. Machacek, D. J. Murtagh, S. Buckman, and J. P. Sullivan, *Phys. Rev. Lett.*, **11**, 113401 (2018)