

Abstract Submitted  
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**Positron elastic scattering by semifilled-shell atoms: the  $e^+ + \text{Mn}$  case**<sup>1</sup> VALERIY DOLMATOV, University of North Alabama, MIRON AMUSIA<sup>2</sup>, Hebrew University, Israel & Ioffe Institute, St. Petersburg, Russia, LARISSA CHERNYSHEVA, Ioffe Institute, St. Petersburg, Russia — Atoms with semifilled shells are special atoms because they possess the highest spin multiplicity among other atoms from the same row of the periodic table. The current knowledge of positron elastic scattering by atoms with multielectron semifilled shells is lacking. We provide the first initial knowledge on this process. As a case study, we focus on positron elastic scattering of a semifilled-shell Mn( $\dots 3d^5 4s^2, {}^6S$ ) atom. Scattering phases and total cross sections are calculated and scrutinized. Electron correlation is accounted for in the frameworks of the self-energy part of the positron's Green function and the RPAE theory. The “spin-polarized” Hartree-Fock approximation is chosen as the zeroth-order approximation. We also account for the formation of virtual Ps and its impact on the scattering process in a simplified but fairly good approximation, as in Amusia *et al.*, Elastic scattering of slow positrons on atoms, *JETP* **97** 34 (2003). We unravel the specificity of the impacts of both the virtually formed Ps and electron correlation on  $e^+ + \text{Mn}$  elastic scattering. The spectacular differences between the electron and positron scattering by Mn are revealed and interpreted as well.

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<sup>2</sup>Prof.Dr. Miron Amusia passed away on September 15, 2021. The study was performed while M. Amusia was affiliated with Hebrew University, Israel and Ioffe Institute, Russia.

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