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Angular distribution of Auger electrons following electron-impact excitation of highly charged Be-like ions

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Electron-impact excitation (EIE) of atoms and ions is one of fundamental processes in astrophysical and laboratory plasmas. Chen et al. [1] studied the relativistic effect on the angular distribution of Auger electrons following EIE of Be-like ions. However, as a main part of the relativistic effect, the Breit interaction on the angular distribution was not considered. In this work [2], we study the angular distribution of the Auger electrons emitted from the nonradiative decay $1s2s^22p_{1/2}$ J=1 $\longrightarrow$ $1s^22s$ J=1/2 of highly charged Be-like Mg^{8+}, Fe^{22+}, Mo^{38+}, Nd^{56+}, Au^{75+}, and U^{88+} ions following the EIE $1s \longrightarrow 2p$ of these ions using the multiconfigurational Dirac-Fock method and the relativistic distorted-wave theory. Special attention is paid to the effect of the Breit interaction on the angular distribution of the Auger electrons. It is found that for low-Z ions the Breit interaction hardly contributes to the angular distribution, while for medium- and high-Z ions the contribution of the Breit interaction is of the essence, which becomes more prominent with increasing impact electron energy.

References
[1] M. H. Chen and K. J. Reed, Phys. Rev. A 50, 2279 (1994).
[2] Z. W. Wu, Y. Li, Z. Q. Tian, and C. Z. Dong, Phys. Rev. A 105, 032809 (2022).

Is this abstract from experiment?

No

Name of experiment and experimental site

N/A

Is the speaker for that presentation defined?

Yes

Details

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https://www.hi-jena.de/
http://www.atomic-theory.uni-jena.de/

Internet talk

Maybe

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