

# Progress in modeling of krypton He-beta lineshape for diagnostics of high-energy-density plasmas

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K-shell transitions of He-like species have been widely used to diagnose high-energy-density plasmas, including those in the inertial-confinement fusion experiments. Recently, Stark broadening of the krypton He-beta line was used for inferring the electron density in NIF compressed capsules [1,2] and suggested for diagnostics in Laser MegaJoule experiments [3]. Here, we report on the Stark lineshape modeling of Kr He-beta based on computer simulations that include electron penetration effects [4], resulting, in particular, in the consistent evaluation of the plasma polarization shift. Measuring the latter can serve as an independent method of plasma density diagnostics. Furthermore, Li-like satellites, contributing to the overall shape of the He-beta complex, were also calculated.

[1] L. Gao *et al.*, <https://doi.org/10.1103/PhysRevLett.128.185002>

[2] K. W. Hill *et al.*, <https://doi.org/10.1088/1361-6587/ac9017>

[3] G. Pérez-Callejo *et al.*, <https://doi.org/10.1103/PhysRevE.106.035206>

[4] E. Stambulchik and C. A. Iglesias, <https://doi.org/10.1103/PhysRevE.105.055210>

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