

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

Evgeny Stambulchik¹, Ramy Doron¹, Yitzhak Maron¹, Manfred Bitter², Hui Chen³, Arati Dasgupta⁴, Philip Efthimion², Lan Gao², Kenneth Hill², Carlos Iglesias³, Bob Kauffman³, Frances Kraus⁵, Brandon Lahmann⁶, Duane A. Liedahl³, Mike MacDonald³, Andrew MacPhee³, Novimir Pablant, Marilyn B. Schneider³, Howard Scott³, Stanislav Stoupin³, Daniel B. Thorn³

¹*Weizmann Institute of Science, Israel*

²*Princeton Plasma Physics Laboratory, USA*

³*Lawrence Livermore National Laboratory, USA*

⁴*Naval Research Laboratory, USA*

⁵*Princeton University, USA*

⁶*Massachusetts Institute of Technology, USA*

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.

References

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Presenting Author Email Address: Evgeny.Stambulchik@weizmann.ac.il