

Abstract Submitted
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Fitting of asymmetric spectral lines as diagnostics for HID-lamps¹

MARTIN WENDT, Fr.-L.-Jahn Str. 19, 17489 Greifswald, GERMANY, SILKE PETERS, HARTMUT SCHNEIDENBACH, MANFRED KETTLITZ — Fitting of optically thick side-on spectra is a valuable alternative to the Bartels' method and the Abel inversion for the determination of partial pressures and radial temperature profiles in HID lamps. We investigate a standard 150 W type HID lamp filled with Hg and NaI during dimming from 150 to 60 W. The model includes LTE plasma chemistry, asymmetric line profiles according to Al-Saqabi and Peach [1]. Van der Waals and Stark broadening constants are determined from spectra of a pure Hg lamp. Broadening constants for the Na D lines are taken from literature. We use the spectra at several side-on positions in order to derive pressures and temperature profiles in the Hg/NaI lamp. The results from fitting show with decreasing electrical power a constriction of the radial temperature profile, a linear decrease of the total pressure and a rapid decrease of the sodium content. Temperatures and total pressures are in good agreement with the experiment.

[1] Al-Saqabi B N I, Peach G (1984) J. Phys. B: At. Mol. Phys. **20** 1175–1191.

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Martin Wendt
Fr.-L.-Jahn Str. 19, 17489 Greifswald, GERMANY

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