

Abstract Submitted  
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**Combination of optical emission and broadband absorption spectroscopy for diagnostics of HID lamps**<sup>1</sup> CORNELIA RUHRMANN, ANDRE BERGNER, THOMAS HOEBING, JUERGEN MENTEL, PETER AWAKOWICZ, Ruhr-University — HID lamps are used in several fields of application e.g. in street or automotive lighting as well as in video projection systems. Most of these lamps contain mercury to generate a high pressure buffer gas filling and thereby an appropriate power input into the arc. Due to its toxicity, the replacement of mercury is of particular interest in recent research of HID lamps. Currently, the emission coefficient of a mercury double line is used to determine the plasma temperature and thereby particle densities inside an HID lamp. A combination of optical emission and broadband absorption spectroscopy allows evaluating the plasma temperature without the need of mercury emission lines. It offers in combination with emission spectroscopy the possibility to calculate the total density of atoms and ions of elements also inside a mercury-free HID lamp. In this paper the measuring method is applied to a mercury-containing special research HID lamp (YAG lamp), seeded with rare earth iodines.

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