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Program and Abstracts

Poster paper

GAS TEMPERATURE FROM LINE BROADENING IN A NEON MICROWAVE PLASMA AT ATMOSPHERIC PRESSURE

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We have used the collisional broadening of neutral neon lines to determine the gas temperature of a microwave discharge at atmospheric pressure. The gas temperature can be obtained from the van der Waals broadening, provided that the Stark broadening is negligible. Thus, the variation of the Stark broadening of the H_β, H_α, H_γ lines has been compared with the Lorentzian width of several prominent neutral neon lines from low-lying levels (close to the ground state). The values of gas temperature obtained have been compared with those provided by OH radicals with an excellent agreement.

Poster paper

SELF-ABSORPTION EFFECTS IN THE EQUIVALENT WIDTH OF THE SPECTRAL LINES IN A NEON MICROWAVE PLASMA AT ATMOSPHERIC PRESSURE

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Atomic metastable Ne($^3P_0$) and resonant Ne($^3P_1$) levels atom concentrations have been determined from the ratio of the total intensities of two partially *self-absorbed* lines, one of them being more strongly absorbed than the other. The ratio of the intensities is related to the *equivalent width*, W, of the spectral lines, whose shape is approximated to a Voigt function resulting from the convolution of a Lorentzian (Stark and Van der Waals effects) and a Gaussian (Doppler effect and optical broadening) profiles. Thus, we have study W in different plasma column lengths and its influence on the value of the metastable and resonant level populations. Under the operative conditions investigated, the concentrations of these levels were $\sim 10^{11}\mathrm{cm}^{-3}$