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Heavy particle temperatures in low pressure N_2 / H_2 discharges determined via OES[1] STEFAN BRIEFI, AG Experimentelle Plasmaphysik, Universitaet Augsburg, Germany, DAVID RAUNER, URSEL FANTZ, Max-Planck-Institut fur Plasmaphysik, Germany / AG Experimentelle Plasmaphysik, Universitaet Augsburg, Germany — A widespread method for obtaining the gas temperature in low pressure discharges is the determination of the rotational population of a molecule via measuring its emission spectra. This can be done either directly if the particular emission lines of the emission band can be resolved or indirectly via simulating an emission band and adjusting the simulation to the measurement if the lines cannot be resolved. The first method is usually applied to the Fulcher transition of hydrogen (d $^3\Pi_u \rightarrow$ a $^3\Sigma_g^+$, located between 590 and 650 nm); a prominent example of the second method is the second positive system of nitrogen (C $^3\Pi_u \rightarrow$ B $^3\Pi_g$, located between 280 and 450 nm). In order to compare the results obtained by these methods, spectroscopic high resolution measurements have been carried out in H_2 / N_2 discharges in a pressure range of a few Pa. The experimental setup is an ICP with a cylindrical discharge vessel (length 40 cm, diameter 10 cm, made out of quartz glass). Besides the determination of rotational and vibrational temperatures of the nitrogen and hydrogen molecule the emission line profile of the Balmer lines is analyzed to obtain the temperature of atomic hydrogen.

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