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Determination of escape factors for the 811.53 nm argon atomic line CHRISTIAN SCHARWITZ, TOSHIAKI MAKABE, Faculty of Science and Technology, Keio University, MAKABE TEAM — As discussed in a previous study [Appl. Phys. Lett. 92 (2008), 071501] it is of interest for the determination of the density of low-energy electrons in Ar-plasmas to perform optical emission spectroscopy (OES) on the atomic transition line of Ar(2p9) to Ar(1s5) at 811.53 nm. For the metastable level Ar(1s5) a high population density is expected and radiation trapping is a challenge for these measurements. Radiation trapping is typically treated with so-called escape factors. To evaluate escape factors for the 811.53 nm Ar line, in our recent work two measurement methods are applied to inductively coupled plasmas. Based on the technique by [J. Phys. D 41 (2008), 065206] one of the methods is developed in such a way that the radiation trapping will have no impact, the other method is affected by the radiation trapping. The analysis of the results of both methods is used to evaluate the escape factors. The obtained escape factors will be presented and the results help to enhance the analysis of the OES measurements. This work is supported by a Grant-in-Aid for the Global COE Program operated at Keio University from MEXT Japan.

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