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A new versatile approximation method for the line radiation description SERGEY GORCHAKOV[1], YURI GOLUBOVSKII[2], DETLEF LOFFHAGEN[1], ALEXANDER TIMOFEEV[2], DIRK UHRLANDT[1], [1]INP Greifswald, F.-Hausdorff-Str. 2, 17489 Greifswald, Germany, [2] St.Petersburg State University, Ulyanovskaya 1, 198504 St. Petersburg, Russia — Reabsorption of radiation in spectral lines is generally neglected in the modelling of low-pressure plasma. However, even small values of the plasma thickness cause an increase of transition probability and influence the density of radiating species. Description of corresponding phenomena follows from the solution of the radiation transport equation [1]. Since the direct solution of this equation is not possible, different approximation methods are used. This contribution presents a new approach for the description of line radiation which is based on an approximation of Biberman's transmission factor [1]. The method consists of an interpolation between the asymptotic expressions for small and large absorption. Results for the spatial distribution of the densities of excited atoms, typical plasma excitation sources and various optical thickness are presented and discussed in comparison with those obtained by the matrix method [2]. The range of applicability of developed method has been evaluated.
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