Inter-comparison of calculation techniques of the electron Boltzmann equation for the analysis of swarm parameters in CO_2[1] M GROFULOVIĆ, N PINHÃO, LL ALVES, V GUERRA, IST/IPFN, University of Lisbon, Lisbon, D LOFFHAGEN, Leibniz Institute for Plasma Science and Technology, Germany, I KOROLOV, M VASS, Z DONKÓ, Institute for Solid State Physics and Optics, Budapest — The plasma-based CO_2 conversion is a promising route for achieving the reduction of fossil fuel consumption and of CO_2 emission. An accurate description of the electron kinetics by solving the electron Boltzmann equation (EBE) is necessary for this application. This work is dedicated to the inter-comparison between various calculation techniques of the EBE (two-term, multi-term and space gradients of the electron density) and the Monte-Carlo reference technique for the analysis of swarm parameters and their comparison with previously available and present experimental data. We adopt the complete set of electron–impact cross sections for CO_2, to be published on the IST-LISBON database with LXCat. Results show that despite the fact that the IST-LISBON cross sections were derived to fit measured swarm parameters when used in a two-term expansion Boltzmann code, good agreement with the other solution and simulation techniques is generally obtained for the electron swarm parameters under consideration.

M Grofulović
IST/IPFN, University of Lisbon, Lisbon

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