Abstract Submitted
for the GEC19 Meeting of
The American Physical Society

OpenGPS: An OpenFOAM solver for simulation of low temperature plasmas.[1] LUIS MARQUES, University of Minho - Portugal, ALEXANDRE SILVA, University of Minho — Predictability in plasma science and engineering based on fundamental modelling has been considered a requirement for progress in the field of low temperature plasmas (LTP). While several in-house and commercial simulation codes exist for this purpose, a common opensource framework that can be developed by the community will likely accelerate the impact of computational studies in LTP. In this regard, we present our initial effort to develop a friendly, versatile, general plasma solver for LTP simulation based on OpenFOAM, an open-source CFD simulation suite that relies on the Finite Volume Method. The solver implements a time-dependent fluid type model to describe charged particle transport in electric discharges in argon, consisting in continuity and the momentum transfer equations for electrons and Ar+ ion, the electron mean energy transport equation, and Poisson's equation for the electric potential. The space-time map of the electron transport and rate coefficients are obtained from the electron mean energy profile, using the local mean energy approximation. In this work we will present preliminary simulation results of DC and RF discharges in argon and discuss the future outlook for the solver suite.

[1]This work was supported by the Portuguese Foundation for Science and Technology (FCT) in the framework of the projects POCI-01-0145-FEDER-028108 and UTAP-EXPL/NTec/0107/2017.

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Date submitted: 01 Aug 2019 Electronic form version 1.4