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Fast computations in atmospheric pressure plasma jets DIMITRIOS PASSARAS, NCSR Demokritos, ELEFTHERIOS AMANATIDES, University of Patras, GEORGE KOKKORIS, NCSR Demokritos — A framework for the computation of plasma-generated species densities in atmospheric pressure plasma jets is developed and applied to kINpen device with Ar feed. The first component of the framework is a turbulent flow model, namely the large eddy simulation (LES) model [1]. The second component is a global model being solved at transient state; a transformation from time to space (distance from nozzle exit) is achieved by using the fluid velocity. The model is implemented with a suitably modified version of πlasma-R code [2] which allows very fast calculations (some minutes for a set of 764 reactions and 84 species). The electron energy distribution function is calculated by Bolsig+. The assumptions frequently used for global models are evaluated in order to examine the extent of their limits. Atomic oxygen measurements [3] are used for the evaluation of the results. LES model is necessary for high accuracy. Simple turbulence models (e.g. realizable k-ε) can lead to significant inaccuracies for specific plasma-generated species. [1] Passaras D et al. 2020 J. Phys. D: Appl. Phys. 53 26 [2] www.plasma-r.com [3] Reuter S et al. 2012 Plasma Sources Sci. Technol. 21 2.

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