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Electron kinetics in fast-pulsed discharges[1] LL ALVES,
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T SILVA, IPFN/IST-UL — This work presents a comparative study of
the electron kinetics in fast-pulsed discharges produced in dry air (80%
N_2 - 20% O_2), considering a quasi-stationary and a time-dependent so-
lution of the electron Boltzmann equation (EBE), written under the
classical two-term approximation. The simulations were performed us-
ing the open-source LisbOn KInetics Boltzmann solver (LoKI-B) [1,2],
which handles simulations in any atomic / molecular gas mixture, con-
sidering first and second kind collisions with any target state (electronic,
vibrational and rotational), characterized by any user-prescribed popu-
lation. The original capabilities of LoKI-B have been extended in order
to obtain the time-dependent solution of the EBE for a pulsed elec-
tric field. Noticeable deviations, between the quasi-stationary and the
time-dependent calculations of the electron energy distribution function
and related macroscopic coefficients, are observed below the microsec-
ond scale, for a pulse peaking at 45 Td with rise and fall times of ˜1μs
and ˜10μs, respectively.
[1] A. Tejero-del-Caz *et al*, Plasmas Sources Sci. Technol. **28** (2019)
043001
[2] https://github.com/IST-Lisbon/LoKI

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