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**Simulation of a streamer breakdown in air** SERGEY PANCHESHNYI, AICHA FLITTI[1], LAPLACE, University of Toulouse, CNRS, France, GEORGE NAIDIS, Joint Institute for High Temperatures RAS, Russia — A numerical code that uses an adaptive grid refinement strategy for the computation of filamentary discharges within the diffusion-drift approximation in 2D and 3D geometry was applied for streamer simulation. The numerical discretization are based on finite volume methods and have 2nd order accuracy in space and time. The main stages of streamer discharge development in air are presented up to the moment of spark formation. In the case of fast breakdown, the plasma conductivity increases thanks to the accumulation of active particles that changes the balance between the rates of generation and loss of electrons due to the acceleration of processes such as detachment, stepwise, and associative ionization, etc. The evolution of plasma composition after the channel bridges the gap has been simulated using ZDPlasKin library in 0D approach; the kinetic model includes 14 components and 48 reactions. This approach exhibits a good agreement with measurements and can be easily applied for other gases and conditions.

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