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Electron Fluid Dynamical Equations for Breakdown Waves Moving into an Ionized Medium MOSTAFA HEMMATI, VREGE AMIRKHANIAN, Arkansas Tech University — For investigation of breakdown waves propagating into an ionized medium, we use a set of one-dimensional, steady state, three component fluid equations. Our set of equations consists of the equation of conservation of mass, momentum, and energy, coupled with the Poisson's equation. We are considering waves for which the electric filed force on electrons is in the opposite direction of the propagation of the wave. Also, the electron gas partial pressure is considered to be much larger than that of the other species; therefore, it provides the driving force for the propagation of the wave. For breakdown waves propagating into an ionized medium, the fluid equations and also the boundary conditions at the wave front have to be modified to account for the current in front of the wave. For breakdown waves propagating into an ionized medium, we will present the modified set of fluid equations, the proper set of boundary conditions, and also the wave profile for electric field, electron velocity, electron temperature, electron number density and ionization rate within the dynamical transition region of the wave.

Mostafa Hemmati
Arkansas Tech University

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