Abstract Submitted
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Current Bearing Electron Shock Wave[1] MOSTAFA HEMMATI, Arkansas Tech University — For analytical solution of breakdown waves, we use a one-dimensional, steady-state, three-component (electrons, ions, and neutral particles) fluid model. The wave front is considered to be a shock front and the electron gas partial pressure is considered to provide the driving force for the propagation of the wave. The basic set of equations consists of the equation of conservation of mass flux, equation of conservation of momentum, equation of conservation of energy, plus Poison's equation. In this study, the emphasis will be on the waves propagating into a neutral medium and we will investigate breakdown waves for which a large current exist behind the wave front. We apply shock conditions to obtain breakdown wave profile for electric field, electron velocity, electron temperature, electron number density, and ionization rate behind the shock front for breakdown waves propagating in the opposite direction of the electric filed force on electrons.

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