

Abstract Submitted
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Modelling gas plasma interactions in driven systems C.S. MACLACHLAN¹, D.A. DIVER, H.E. POTTS, University of Glasgow, Dept. of Physics & Astronomy, Kelvin Building, University of Glasgow, G12 8QQ, UK — We explore numerically the impact of collisions in gas plasma systems and possible ways to exploit plasma chemistry in different experimental contexts. **Electron Avalanches:** We investigate the early stages of the initiation of a high pressure discharge paying particular attention to the production of excited neutral species. This highly non-equilibrium initiation is a Townsend-like avalanche created by electron impact ionisation and occurs on a sub-nanosecond timescale. Understanding this stage of the discharge could identify a technique for the non-steady production of metastables for high-activation energy chemistry without full plasma ignition. **Electronegative Instabilities:** Instabilities manifesting as variations in light emission and number density have been reported in electronegative discharges. Here electron attachment and detachment drives a radiative instability in a pre-formed RF discharge. We propose a simple model that captures the physics behind the experimental phenomena.

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