



## **The formation of oxygen density striations in the diffusion region**

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We investigate the role of a background oxygen population in magnetic reconnection, using Particle-In-Cell (PIC) simulation with time-dependent inflow. The cold oxygen population is inserted initially in the inflow region, and as time evolves it is captured by the reconnection process. We study the formation of oxygen density striations, characterized by narrow bands of high oxygen density in the diffusion region. The density striations are forming from an initially cold oxygen population. This trapped population arises from a temporally changing potential well, due to the Hall electric field. We show that the dynamics of the oxygen population is dominated by electric forces, while the magnetic forces are nearly negligible.

A separate simulation, with the same number density, shows the behaviour of the oxygen population with 10% of the ion temperature. We show how this oxygen population is captured by the reconnection process compared to the cold oxygen population.