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Benchmark simulations of electronegative discharges DEREK MONAHAN, MILES M. TURNER, Dublin City University, Ireland — There has recently been much interest—and some controversy—concerning the structure of electronegative discharges. These discharges can exhibit complicated spatial structures including stratification into electropositive and electronegative regions. Moreover, there are appreciable differences between discharges where the dominant negative ion destruction mechanism is detachment and those where it is recombination. In this paper we present benchmark particle-in-cell simulations for discharges in Ar/O₂ mixtures. These simulations cover a wide range of conditions in terms of collisionality, electronegativity, and negative ion destruction mechanism. We will discuss the changes in the spatial structure of the discharge that occur as the conditions change, including the appearance of structures such as double layers.

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