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A numerical study on the Equatorial Plasma Bubble seeded by the pre-reversal vertical drift: A three-dimensional perspective

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Sousasantos, J.; Kherani, E. A.; Sobral, J. H. A.; Abdu, M. A.; Moraes, A. D. O.; da Silva, A. L.

During the last decades several seeding sources mechanisms were proposed to explain the generation of large scale depletions in the equatorial and low latitudes plasma known as Equatorial Plasma Bubble Structures. Numerical simulations have used direct density perturbations with couple of shapes, gravity waves, etc. In this work the pre-reversal mechanism is evaluated without the contribution of none of these external sources of perturbation. The variation of the vertical drift during its pre-reversal period in time and space was already suggested as a potential seeding source mechanism and this hypothesis was tested bidimensionally, however, the ambient conditions for an effective action of such seeding mechanism was found to be severe. The three-dimensional approach intends to evaluate a more realistic scenario, where the parallel conductivity could decrease substantially the action of the proposed mechanism. The results indicate that the mechanism is efficient in the instability seeding even in face of a more unfavorable scenario.

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