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Two decades of airglow observation of equatorial plasma bubbles in the Brazilian equatorial region

Igo Paulino[1], Ricardo Arlen Buriti[1], Amauri Fragoso de Medeiros[1], Ana Roberta Paulino[2], Cristiano Max Wrasse[3], Hisao Takahashi[3],

[1] Unidade Acadêmica de Física, Universidade Federal de Campina Grande, Campina Grande, Brazil

[2] Departamento de Física, Universidade Estadual da Paraíba, Campina Grande, Brazil

[3] Divisão de Clima Espacial, Instituto Nacional de Pesquisas Espaciais, São José dos Campos, Brazil

e-mail (speaker): igo.paulino@df.ufcg.edu.br

Since September 2000, an all-sky airglow imager has operated in São João Cariri (7.4oS, 36.5oW). Equatorial plasma bubbles (EPBs), which are large scale structures of abrupt depression in the ionospheric density were studied using OI6300 and OI7774 images. During these almost two solar cycles, we learned that the EPBs occur preferentially from September to April in Brazil. The EPB zonal drifts can reach up to 120 m/s to the east being seasonal and solar dependents. During magnetic storms, the EPB dynamics can change drastically, and they can even reverse the propagation direction to the west. Recent investigations into the coupling of the neutral atmosphere and ionosphere revealed that waves and tide from the lower atmosphere affect the occurrence and dynamics of the EPBs. For instance, the lunar tide can change the start time of EPBs in ~13 min and modulates the EPB zonal drifts with amplitude of 5%. In this talk, salient aspects about the morphology and dynamics of EPB over Brazil will be presented and discussed.