



Ionospheric plasma bubbles over Africa during 2004

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Ionospheric plasma bubbles (EPBs) are extensive areas of depleted F-region plasma density generated in the equatorial nighttime F-region from irregularities and plasma upward drifts. They reveal local ionospheric instability and seriously degrade communications and navigation signals by introducing rapid changes in both amplitude and phase of the radio signals. In spite of the large attention paid to this phenomenon in the last years, the EPBs occurrence and their properties are not well understood due to their complicated behaviour in relation with season, longitude, latitude, solar cycle, neutral winds, geomagnetic perturbations, etc.

Following previous studies, we present herein some results related to the bubbles detected in the Equatorial African region during 2004. We use calibrated data of slant total electron content (sTEC) from EGNOS Test Bed (BRAZ, DOUA, LOME, and NDJA) and IGS (ASC1, MALI, and NKLG) stations. With the aim of characterizing their seasonal dependence in each station, we analyse the temporal evolution of the number of detected bubbles per month in each station, and the monthly sTEC depletion size averages. In addition, we are able to locate each bubble both geographically and temporally by estimating the coordinates of its associated pierce point, as first approximation, and retrieving the local time of their occurrence.

Plans for the future include developing a procedure to estimate possible effects in the positioning systems considering a simple geometrical configuration.