

## TRACING THE TRAVELLING OF STRESS DEFORMATION WAVES IN COASTAL REGION OF NIGERIA USING GLOBAL POSITIONING SYSTEM (GPS)

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### ABSTRACT

The availability of precise and reliable deformation information is critical for the monitoring and analysis of the earth's surface displacement, the movement of fault, landslides and some other deformations. In addition, proper site selection of important structures and their protection against hazards and the ability to analyse and predict natural and non-natural hazards are of great importance in geosciences. Monitoring of deformation in Coastal region of Nigeria is of great importance, providing useful information to assess seismic hazard and risk. Natural hazards that have disastrous impacts on humans include earthquakes, landslides, floods, storm surges, severe winds, bushfires, and tsunamis. Thus, this study involves the use of the Nigerian Continuously Operating Reference Station (CORS) in Coastal region for tracing and analyzing stress deformation wave along the coastal region of Nigeria. NIGNET GPS data for the periods 2012 and 2013 were collected and processed on same phases. From the comparative analysis between the 1<sup>st</sup>, 3<sup>rd</sup> campaigns and 2<sup>nd</sup>, 4<sup>th</sup> campaigns show that there was a small significant displacement in the vertical direction, of approximately 0.39mm/yr and 0.47mm/yr. Both the magnitude and direction of the whole changes agree well with the velocity of approximately 0.4mm/yr and 0.5mm/yr. The relative horizontal positions of the changes are not notably affected from the local geological features. This implies that the faults and/or landslide bodies near those stations used are relatively stable.

**KEYWORDS:** Deformation Monitoring, GPS; NIGNET, Tracing Stress, Velocity