Four-Dimensional Hologram Interferometry for Urban Slum Reconstruction

Maged Marghany\textsuperscript{1}

\textsuperscript{1}Institute of Geospatial Science and Technology (INSTeG) Universiti Teknologi Malaysia, Malaysia

Abstract

In this study, hologram interferometric with 3D phase unwrapping is used to reconstruct fourth-dimensional urban slum in Cairo city, Egypt. The data are used that involved two ENVISAT ASAR data, with SRTM digital elevation model (DEM). The results show that the hologram Interferometric is an excellent tool for chaotic urban slum as it can discriminate between them from its surrounding environment. The combination of hologram Interferometric, DEM, time changes, then used to reconstruct 4-D of urban slum. Hologram interferometric shows a great overlapping between high class area with urban slum with every and less than 4 m. The results show that urban slums, road network, and infrastructures are perfectly discriminated. In conclusion, that the hologram Interferometric is an appropriate algorithm for chaotic 4-D urban slum automatic detection in ENVISAT ASAR data.

Keywords: Hologram Interferometric, ENVISAT ASAR, Urban Slum, Fourth-dimensional

Contribution of Study

This study proposed a method for 4-D reconstruction from remote sensing data.