Abstract:

This paper reports on a study carried out for the generation of three-dimensional (3D) ocean bathymetry using airborne TOPSAR data. The main objective of this study is to utilize fuzzy arithmetic for constructing ocean bathymetry from polarized remote sensing data such as a TOPSAR image. In doing so, two three-dimensional surface models, the Volterra model and a fuzzy B-spline model which construct a global topological structure between the data points were used to support an approximation of real surface. The best reconstruction of coastal bathymetry of the test site in Kuala Terengganu, Malaysia, was obtained with polarised C bands TOPSAR acquired with VV polarization. With 10 m spatial resolution of TOPSAR data, an accuracy of (root mean square) ± 0.03 m was found with Cvv band.