

DInSAR Technique for Three-Dimensional Coastal Spit Simulation from Radarsat-1 Fine Mode Data

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A b s t r a c t

This work presents a new approach to 3D spit simulation using differential synthetic aperture interferometry (DInSAR). In doing so, conventional DInSAR procedures are implemented to three repeat passes of RADARSAT-1 SAR fine mode data (F1). Further, a new application of using fuzzy B-spline algorithm is implemented with phase unwrapping technique. The study shows that the performance of DInSAR method using fuzzy B-spline is better than the DInSAR technique, which is validated by the coefficient of determination r^2 of 0.96, probability p of 0.002, and accuracy (RMSE) of ± 0.034 m, with 90% confidence intervals. In conclusion, integration of fuzzy B-spline with phase unwrapping produces an accurate 3D coastal geomorphology reconstruction.

Key words: DInSAR, fringe, interferogram, fuzzy B-spline algorithm, coastal geomorphology, spit, digital elevation model (DEM).