

Monitoring of Bridge Deformation with InSAR: An Experimental Study

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SUMMARY

Reliable monitoring of long-term deformation of flexible structures such as large-scale bridges to assess the structural safety is vitally important. We experiment to apply satellite interferometric synthetic aperture radar (InSAR) to monitor the deformation of Donghai Bridge that has a total length of 32.5km. We develop a new method to identify and extract temporarily coherent points (TCP) between two SAR acquisitions based on the spatial characteristics of offset consistency in both the range and azimuth directions. A least squares model for multi-master interferogram stacking is also proposed to resolve the velocities of the TCP from the wrapped phases. The experimental results are presented along with discussions of the quality of the results. The research shows that it is possible to apply the space based radar remote sensing technology to monitor deformations of mega structures such as the large bridges.

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