

BUILDING DAMAGE ESTIMATION MODEL USING TERRASAR-X OBSERVING THE 2010 HAITI EARTHQUAKE

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Abstract: With the aim of developing a model for estimating building damage from high-resolution synthetic aperture radar (SAR) data at X-band, which is appropriate for Haiti, we propose a regression discriminant function based on damage interpretation dataset in Port-au-Prince, which was seriously affected by the 2010 Haiti earthquake. The function can discriminate damage ranks corresponding to the severe damage ratio of buildings using TerraSAR-X imagery of the disaster area before and after the earthquake. By calculating the differences in and correlations of backscattering coefficients, which were explanatory variables of the regression discriminant function, we determined an optimum window size capable of estimating the degree of damage more accurately. A normalized likelihood function for the severe damage ratio was developed based on discriminant scores of the regression discriminant function.

Keywords: building damage ratio, TerraSAR-X image, Haiti, likelihood function, backscattering coefficient