



Earthquake urban damage assessment from satellite data

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A fast and draft damage map by satellite images of the hit urban areas is a useful tool to lead first aid activities of the rescue teams, in particular when the seismic event is located in remote regions, or when the main communication systems are damaged.

The present work reports some results obtained in different case studies, with the aim to explore the capabilities of radar and optical data acquired from spaceborn platforms, to detect and quantify the damage in urban areas. Two destructive seismic event have been analysed: the 1999 Turkey earthquake and the Iran one, occurred on December 2004. The methodology to assess damage in the cities of Izmit and Adapazari, for the Turkish event, and Bam, for the Iranian event, is presented. The comparison with on ground information is also reported in order to validate the results obtained by the satellite data processing.

This study proposes the development of ad hoc algorithms and procedures for data processing and, where possible, data fusion. When either SAR and optical data were available, like for the Izmit event, automatic procedures for damage assessment have been successfully applied, reaching the 90% of correct pixel-to-pixel classification. On the contrary, we realised that the lack of a suitable dataset, i.e. enough number of images and spectral bands (SAR images alone or optical images alone) hampers the application of ad hoc damage detection procedures and affect the reliability of the damage maps.