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Building damage scale proposal from VHR satellite image

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Natural hazards have a huge impact in terms of economic losses, affected and killed people. Current exploitation of remote sensed images play a fundamental role in the delineation of damages generated by catastrophic events. Institutions like the United Nations and the European Commission designed services that provide information about the impact of disasters rapidly. One of the approach currently used to carry out the damage assessment is based on very high resolution remote sensing imagery (including both aerial and satellite platforms).
One of the main focus of the responders, especially in case of events like earthquakes, is on buildings and infrastructures. As far as the buildings are concerned, to date international standard guidelines that provide essential information on how to assess building damages using VHR images still does not exist.
The aim of this study is to develop a building damage scale tailored for analyses based on VHR vertical imagery and to propose a standard for the related interpretation guidelines. The task is carried out by comparing the current scales used for damage assessment by the main satellite based emergency mapping services. The study will analyze the datasets produced after the Ecuador (April 2016) and Central Italy(August and October 2016) earthquakes.
The results suggest that by using VHR remotely sensed images it is not possible to directly use damage classification scales addressing structural damages (e.g the 5 grades proposed by EMS-98). A fine-tuning of existing damage classes is therefore required and the adoption of an internationally agreed standard should be encouraged, to streamline the use of SEM products generated by different services.