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Visual Interpretation of Very High Resolution (VHR) Stereoscopic Satellite Images for Landslide Recognition and Mapping

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Traditional methods used to prepare landslide inventory maps consist in visual interpretation o stereoscopic aerial photography, supported by field surveys. New techniques, based on satellit remote sensing technologies, can simplify and assist the production of landslide maps. VHR satellit stereoscopic images can be an alternative to stereoscopic aerial photographs for landslide detectioi and mapping in all terrain types, and in different land cover conditions. Visual analysis of th images allows the recognition of the slope failures and accurate 3D mapping of the landslides Stereoscopic satellite images cover a significantly larger area than single pairs of aeria photographs, and allow the construction of single stereoscopic 3D model. Exploiting VHR images i possible to have a single, extensive view of the study area, and to map small and large landslide without changing the viewpoint, or the pair of aerial photographs. This facilitates the task of th interpreter and improves the acquisition of the geomorphological information.

We present the results of a study, carried out in in Mexico and in Italy, aimed to evaluate th capability of the VHR stereoscopic satellite images to recognize and map different landslide type in different geo-morphological settings.. For the purpose we analyzed the following images: i pansharped images acquired by the GeoEye satellite sensor taken the 31 March 2010, for th Mexico study area- and ii) panchromatic images acquired by the WorldView satellite sensor on : March 2010, and by the GeoEye satellite sensor on 27 May 2010, for the Italian study area. Th satellite images or products we used in the two test areas have a ground sampling distance of 50 cm adequate for mapping and measuring most of the shallow landslides. We present the photo interpretation criteria we used to prepare the two landslide inventory maps regarding differen environment conditions and landslide types.