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A prototipe of landslide observatory in the eastern italian alps

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In this work we present the results related to several field campaigns conducted in the last three years in a small (4.4 km2) wilderness basin in Carnia, a tectonically active alpine region in northeast Italy. The study area is a typical alpine debris-flow dominated catchment (Tarolli and Tarboton, 2006; Tarolli and Dalla Fontana, 2009), where several landslides, including a large one, were observed and mapped. The field survey carried out in 2007, 2008, 2009 and 2010 were focused on the large landslide of the basin and they consisted in: 1) development of an accurate GPS network, 2) use a long range Terrestrial Laser Scanner (TLS) for a detailed and local analysis of landslide movements, 3) merge the data with an airborne LiDAR for a large scale of analysis of the processes. Preliminary analysis consisted in the comparison of different high resolution Digital Terrain Models (DTMs) in order to estimate the debris volume that has been triggered during the last movements of the landslides. Achieved results show that the integration between ALS and TLS data allows to produce DTMs of limite extent, with higher quality and level of detail. Such DTMs improves the capabilities for landslides analysis and modeling with respect to the use of LiDAR data only, even in areas providing limited or difficult access to surveying activity.