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Production of checked DTM by Terrestrial Laser Scanner (TLS)

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Has been implemented a procedure of calculation and experimentation addressed to the extraction of DTM and validated elevation values with a distribution pseudo regular by TLS data.
The calculation procedure was developed in MATLAB environment and is able to generate digital terrain models, through two-dimensional functions with assigned structure, from data collected using laser scanning supplemented with data collected by topographical techniques and GPS . The third dimension (height of the points) has been calculated by least squares estimation from some points with surveyed height topographically. Has been made, at first, a field test on which were conduced survey integrated methodologies. In particular, has been surveyed points at a distance minor of two meters, with classical topographic technique , using a total station of good accuracy. On the same points has been conducted simultaneously a kinematic GPS survey mode. Finally, has been made a TLS survey using a TOF instrument, setting the grid acquisition with range and density maximum witch corresponded to a mesh of points equal to a 0.05 x 0.05 m. The results obtained allowed the assessment of the appropriate procedure and simplified for determination of the DTM using laser technology and the possibility of improve and verify the accuracy attainable of the altitude plane. This led to the definition of the relevant procedure simplified and integrated (depending on the required precision with classical topographical and/or kinematic GPS survey) and a calculation method that allows by the creation of gratings digital terrain models altimetrically compensated from TLS data. In the future will be implemented a software for the morphological characterization procedures that will consider also filtering and classification of laser data in order to apply to any type of surface.