Farmland terrace slope detection from Pleiades digital elevation models

Jean-Stephane Bailly (1), Giulia Sofia (2), Nesrine Chehata (3), Paolo Tarolli (2), and Florent Levavasseur (4)

(1) AgroParisTech, UMR LISAH, F-34060 Montpellier, (2) University of Padova, Department of Land, Environment, Agriculture and Forestry, Legnaro (PD), Italy (giulia.sofia@unipd.it), (3) Bordeaux INP, EA 4592, F-33607 Pessac, (4) Inra, UMR LISAH, F-34060 Montpellier

The automatic mapping of terrace slopes in terraced landscape from remote sensing is still an open question. Among remote sensing data, high resolution digital elevation models appear obviously as the required data to perform such automatic mapping. Pleiades satellite constellation, with its agility, provide new highly resoluted digital elevation models with metric resolution. The objective of this work is to quantify the performances of Pleiades DEMs in Farmland terrace slope mapping. Detection of terrace slopes are performed comparing two existing methods : one using the Fast Line Segment Detector algorithm and the other using curvature thresholding. The obtained detection performances on a South of France farmland landscape are compared using a surface model or a terrain model, and in comparison with LiDAR models. Results show that, despite having lower performances than LiDAR models, Pleiades metric elevation models, even surface models allow the automatic detection of terraces slopes higher than 2 meters.