

BEACH TOPO-BATHYMETRY COMBINING DRONE AND VIDEO IMAGERY

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RESUMO

Mapping beach topography and nearshore bathymetry is fundamental to understand coastal physical processes and to support coastal management decision-making. Conventional survey methodologies require intense human effort and are logistically difficult to perform, especially at the high energetic Portuguese coast. Video imagery techniques arise in this context as a valid alternative, as they allow fast and more frequent topo-bathymetric survey with an adequate resolution.

This communication presents a beach topo-bathymetric field survey obtained by a combination of two video-based techniques, namely unmanned aerial vehicle (UAV) and Internet Protocol (IP) camera. Photogrammetric procedures were applied to images acquired by an UAV during two 20-minutes flights to achieve the Digital Elevation Model (DEM) of the subareal beach. Besides, the images acquired by an IP camera installed on the highest dune backward the beach were used to determine nearshore bathymetry through the depth inversion technique. A full description of topo-bathymetric beach map was achieved joining the output of the two video-based techniques.

The field work was undertaken at the Costa Nova beach (West Aveiro - Portugal) in November 2018. Video-based results were compared to conventional data acquired by a differential system (DGPS) mounted on a quad motorcycle, and a Trimble RTK-DGPS installed on a geodetic unicycle. The resolution of the video-derived beach topo-bathymetric map confirmed the suitability of the methods in providing beach survey with accuracy compatible with that required for a quantitative analysis of coastal processes.

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Palavras-chave: nearshore; remote sensing; coastal management