

Assessment Quality of an Uav–Based Orthomosaic and Surface Model of a Breakwater

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SUMMARY

The low price and the quality of the products derived from photographs taken by cameras mounted on unmanned aerial vehicles (UAV) turn them very attractive to be used in several situations, namely when the area that need to covered hasn't a large extension or when is necessary to have data, like coordinates of points, on a periodic basis. The monitoring of the behavior of breakwaters fall is this category of works. Usually with extensions of some hundred meters long, with only a few meters high and with long flat surfaces, breakwaters are structures with a shape very attractable to be monitored by unmanned airplanes and helicopters. The National Laboratory for Civil Engineering, from Portugal, responsible by the evaluation of new methodologies and techniques applied to the monitoring of large civil engineering structures like dams, bridges, buildings and breakwaters, has been testing the use of an unmanned small airplane in the monitoring of a 400 m long breakwater. The first stage of the work was to assess the quality of the surface model build with the use of photographs taken by a small digital camera mounted on an UAV. By comparing coordinates of selected points extracted from the digital surface model, build with images taken at an average altitude of 185 m, with coordinates derived from GNSS high quality observations, it was obtained differences of 6 cm (msqe) in planimetry and 12 cm in height. This paper describes the conditions of the UAV flight and of the breakwater environment, conditions that were particularly hard, and presents the results of the quality control of the surface model, made with the use of statistical methods.