



Monitoring non-tectonic surface deformations by space and classic geodesy techniques. Applications for arc dams

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Integrating satellite geodesy and classic geodesy techniques like high accuracy leveling is a powerful approach to try to determine the way various surface deformations could be correlated with human activities. We present a case study from the highest arc dam in SE Europe, Vidraru Dam, Romania. It is a double curved dam of 166 m height and 465 cubic m of water into the artificial lake. We have shaped a dense GPS and leveling network and carried out two-three measurement campaigns per year. The data processing has been completed by various techniques and software packages, and the interpretation is a complex one, taking into account not only the structural characters of the dam but also the tectonics of the surrounding region as well as the water variation in the lake. Integration with other information like the water level variation into the artificial dam, climate changes over the four seasons could give useful hints on the interpretation of geodesy results. Different effort distribution, upstream and downstream, and their interconnection with the base, country rocks is critical in order to get a coherent model. This example is detailed in order to proof the advantages of complex use of classing and satellite geodesy techniques for industrial applications in hydro-electric industry which could be of great help in order to monitor the behavior of such huge constructions which, in case of dangerous movements, could easily generate combined man-made and natural disasters.