



## **Ground deformation in the Rio-Antirio area, Corinth Gulf, Greece, based on PS images interferometry and potential related geo-hazards**

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Ground deformation is the surface expression of various physical processes such as landslides, ground subsidence and earthquakes. Construction and operation of engineering structures in urban or in rural areas can be affected seriously by ground conditions leading to casualties and economic losses. We focus at the example of the new bridge Rio-Antirio, an important infrastructure which is the longest cable stayed bridge all over the world. Being of a length of 2,250 m it is located in the strait at the northwest edge of Peloponnese, connecting the Gulf of Corinth and the Gulf of Patras, in central Greece. This important bridge facilitates the transportation between Greece and the Western Europe through the Patra's harbor. The area of the strait is characterized by a variety of natural hazards like the absence of stiff seabed, strong seismic activity, tectonic movements, which make the area highly susceptible to ground deformation and the bridge an element at risk. The aim of this paper is to study the observed ground deformation in the area of Rio-Antirio and interpret the potential causes of the deformation. We combine results of the PS interferometry (IPTA method) covering the period from 1992 to the present using ERS1 & 2 scenes and ENVISAT with seismicity data, active tectonics, slope failure, coastal sediment compaction, hydrology and seabed stability. Hazard assessment, prevention and mitigation are discussed under the light of the results in a scheme which includes the exposure item (bridge), hazard (multi-source induced ground stability) and risk (possible impact).