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Shear-wave splitting in western Corinth Gulf, Greece, in a period that includes the occurrence of two strong earthquakes

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The Corinth Gulf is often referred to as a natural laboratory for the study of continental rift tectonics. It is a fast-spreading intra-continental rift, with the geodetically measured extension varying from ∼5 mm/yr at the eastern part, to ∼15 mm/yr at the western part. It is structured by a set of E-W striking, en-echelon active normal faults, presenting an interseismic N-S extension. The high strain rate in the western Corinth Gulf is accompanied with a high level of microseismicity. On 18th and 22nd of January, 2010, two strong earthquakes of Mw 5.3 and Mw 5.2, respectively, occurred near the village of Efpalio in western Corinth Gulf. These events were followed by a dense seismic sequence providing good quality data for shear wave splitting analysis. Thus three-component seismograms were analyzed in order to detect shear wave splitting parameters. The studied events occurred in the epicentral area of the two strong events during the period of 2009 and 2010. We used recordings from the local seismological stations of the Hellenic Unified Seismological Network (HUSN). The stations are equipped with three-component, broadband sensors. The cross-correlation method was used in the analysis and results revealed the presence of shear wave splitting in the area. With this study, we attempt to present the relation between the anisotropic signature of the upper crust in western Corinth Gulf and the geotectonic framework of the area, and also, the relation between the temporal variation of the splitting parameters and the occurrence of the two strong events of Efpalio.