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Combing X-Band SAR interferometry and optical satellite imagery for landscape archaeology – case studies from Cilicia (Turkey)

Since 2005 the Institute for Archaeological Sciences at the University of Bern has participated in research cooperation with the Istanbul Üniversitesi and the Onsekiz Mart Üniversitesi Çanakkale to explore the archaeological sites within the province of Plain Cilicia (lat. Cilicia Pedias) today Adana district in Turkey.

A particular focus is thereby placed on the combination of large-scale remote sensing (using optical and SAR satellite imagery) and exemplary investigations of prominent sites by archaeological surveys and excavations. The aim of this combined approach is to get a better understanding of the interaction of landscape development and settlement activity.

Especially the strategically important and even fertile plain of Cilicia is characterized by a steady change of river courses, preserved in a huge amount of palaeo-channels detectable by remote sensing. The profound knowledge of this historic condition at different epochs is the key to understanding boundaries between different city states and the network of traffic routes joining them.

The paper describes the methodical approach used in mapping palaeo-riverbeds by an integrative interpretation of both optical and SAR satellite imagery. A special focus is placed on the discussion of the first results gathered from the processing of high resolution SpotLight coSSC data. In order to use the full information potential of the combined StripMap and SpotLight data takes, we developed a workflow for the successive optimization of the DEM quality using all available input data.

Keywords: SAR, interferometry, landscape archaeology, palaeo-channels, Cilicia

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