



Geodetic monitoring of the subsidence in the Po River Delta (Italy)

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The Po is the largest river of Italy, it opens with a delta mouth in the Adriatic Sea and it is bounded by the Apennines to the South and by Alps to the North and West. The modern delta occupies a broad area of about 380 Km², with a coastal extension of around 120 Km. Several industrial activities, intensive farming and important naturalistic areas are located in the Po delta. Most of this land lies below the mean sea level, factor that increases the flooding risk and endangers the human activities in the area and the delta ecosystem due to the combined effects of land subsidence and sea level rise. The subsidence in the Po delta can be considered as the combination of natural and anthropogenic factors. The natural land subsidence is in the order of some millimetres per year and is given by both tectonic and sediment compaction processes. The anthropogenic subsidence reaches some tens of millimetres per year and results mainly from the groundwater and gas extraction activities that began in the second half of the past century during the economic boom of Italy. In order to monitor and study the evolution of the subsidence in this area, we have projected and installed the PODELNET (Po DELta NETwork) GNSS network. The 46 non permanent GNSS sites have been measured in 2016 and 2018 always in the same period (June-July) in order to reduce the influence of possible seasonal signals. We will show the first kinematic results obtained from the analysis of the data acquired during the two campaigns and the comparison with the rates measured by the continuous GNSS stations (CGNSS) located in the area. The results obtained by different software and approaches will be argued in order to evaluate the repeatability and accuracy of the estimated subsidence velocities. Furthermore, we will discuss about the possible temporal evolution of the subsidence rates at the CGNSS sites and about the comparison with the results obtained with other geodetic techniques such as InSAR and precise levelling.