



## Mean sea-level height variations in the Central Mediterranean

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The Italian tide gauge network has experienced difficulties during last century. However, historical time series, starting from the end of the nineteenth century, are available in the PSMSL data base (Permanent Service for Mean Sea Level, <http://www.psmsl.org/data/>). Data from the early 1980s can also be obtained from the data base of ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale, <http://www.mareografico.it>). In 1998, the Italian national tide gauge network (Rete Mareografica Nazionale – RMN) was completely restructured; it consists of 36 homogeneously distributed stations providing measurements sampled every 10 minutes. We have analyzed both the historical and the recent time series of a sub set of stations located in the Tyrrhenian area by using the Empirical Orthogonal Functions (EOF) approach. The EOF analysis allows describing one data set as a linear combination of orthogonal components, or modes, that depend on position only, while the linear combination coefficients are functions of time only. Each mode is associated to a percentage of the total variance of the original data set, which accounts for the relative importance of the corresponding mode of variability. The aim of this work is to identify common modes which could possibly be related to wide area crustal deformation and/or to climatic fluctuations, such as the inverted barometer effect.