



Geodetic infrastructure at the Barcelona harbour for sea level monitoring

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The presentation is directed to the description of the actual geodetic infrastructure of Barcelona harbour with three tide gauges of different technologies for sea level determination and contribution to regional sea level rise and understanding past and present sea level rise in the Barcelona harbour. It is intended that the overall system will constitute a CGPS Station of the ESEAS (European Sea Level) and TIGA (GPS Tide Gauge Benchmark Monitoring) networks.

At Barcelona harbour there is a MIROS radar tide gauge belonging to Puertos del Estado (Spanish Harbours). The radar sensor is over the water surface, on a L-shaped structure which elevates it a few meters above the quay shelf. 1-min data are transmitted to the ENAGAS Control Center by cable and then sent each 1 min to Puertos del Estado by e-mail. The information includes wave forecast (mean period, significant wave height, sea level, etc.). This sensor also measures agitation and sends wave parameters each 20 min. There is a GPS station Leica Geosystems GRX1200 GG Pro and antenna AX 1202 GG.

The Control Tower of the Port of Barcelona is situated in the North dike of the so-called Energy Pier in the Barcelona harbor (Spain). This tower has different kind of antennas for navigation monitoring and a GNSS permanent station. As the tower is founded in reclaimed land, and because its metallic structure, the 50 m building is subjected to diverse movements, including periodic fluctuations due to temperature changes. In this contribution the 2009, 2011, 2012, 2013 and 2014 the necessary monitoring campaigns are described.

In the framework of a Spanish Space Project, the instrumentation of sea level measurements has been improved by providing the Barcelona site with a radar tide gauge Datamar 2000C from Geonica S.L. in June 2014 near an acoustic tide gauge from the Barcelona Harbour installed in 2013. Precision levelling has been made several times in the last two years because the tower is founded in reclaimed land and a little far away from the geographic location of the pulse and acoustic radar location on the Europa bridge. The measured settlement rate is about 1cm/year that may be could mask the values registered by the tide gauge.

An intercomparison of the results of the three different tide gauges is presented and discussed.

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