



Combining magnetic and seismic reflection data for characterization of inner shelf sand nourishment areas

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The CHIMERA project, contracted by the Portuguese Environment Agency (APA) and co-funded by the European Union Cohesion Fund (Portugal 2020 | POSEUR) intended to characterize the sedimentary record of three 10 km² areas and one 5 km² area in the Portuguese inner shelf. Multibeam bathymetry and backscatter, parametric echo-sounder, ultra-high resolution multichannel seismics and magnetic data were acquired along high resolution orthogonal grids. The main aim of the project was to evaluate potential borrow areas for high-magnitude beach nourishments in long term eroding stretches of the Portuguese western coast. The diversity, the large density and the high quality of geophysical data allow for a multidisciplinary geological interpretation of the datasets.

In this presentation we focus on magnetic data and its interpretation combined with acoustic data. We applied a detailed processing scheme to acquired magnetic data, which allowed retrieving several components of the magnetic spectrum and estimating some source depths. We then analyzed the geological significance of the anomalies by studying their correspondence to seismostratigraphic units mapped from seismic data. Fit between magnetic signature and geologic structure was found for most of the cases, although magnetic anomalies within the same wavenumber spectrum may express different geological units for each study area. A correspondence was typically found for the basement, and for recent sedimentary structures such as paleo-channels and paleo-coastal barriers. In other cases, low wavenumber anomalies may express intra-basement geology, too deep to be observed by our high-resolution seismics. For individual anomalies we check for a relation with shallow features, eventually archeological artifacts.

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