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Cross-shelf and along-shelf fluxes derived from observation and modelling in the Gulf of Naples

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Hydrological and currentmeter observations were collected on the continental shelf and slope of the Gulf of Naples during the GELATO experiment in the framework of med-TOSCA project (27 July to 6 August 2012). Results from the cruise are used to estimate the onshore/offshore cross-frontal transport at the shelf break of the Gulf of Naples.
The hydrological structures evidence well-stratified water masses on the eastern and western ends of the shelf. In the coastal area the situation is quite complex, with the influence of the Sarno river’s freshwater plume in the first meters of the water column.
ADCP current profiles were used to estimate integrated transport along the meridional transect connecting the northern and southern gulf coast. ADCP data are missing in the surface layer because of the transducer ringing effect. To add the surface contribution to the total transport, HF radar current measurement were used to determine this component. CTD measurement were collected approximately along the same transect so both the barotropic and baroclinic contribution to the total transport can be evaluated.
In addition, coastal circulation is simulated with a high resolution three-dimensional numerical model forced by daily realistic forcing along with heat and salt fluxes calculated by bulk formulae. The model outputs are in agreement with the main hydrological and circulation patterns and reproduces well the onshore transport.