



Water circulation observations in the shelf under severe cross-shelf winds. The case of Sant Jordi Bay (NW Mediterranean Sea)

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This work presents the results of the analysis of one-year water current measurements recorded in Sant Jordi Bay (NW Mediterranean Sea) at 43.5 m water depth. This area is characterized by episodes of intense offshore winds during winter and fall. During these periods, correlations between cross-shelf circulation and cross-shelf winds are observed in the measurements. The cross-shelf circulation prevails in front of the along-shelf water circulation. This pattern diverges from other shelves where the along-shelf circulation dominates due to the weaker cross-shelf winds and the coastal boundary constraint (Lentz and Fewings, 2012; Grifoll et al., 2012). During winter the observations exhibit offshore flow in the entire water column as a result of flow convergence under well-mixed conditions. During summer a predominantly two-layer flow in the cross-shelf direction occurs enhanced by the water column stratification. Preliminary numerical simulations seem to corroborate the complex water circulation pattern described by the observations.