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Particle transport in the central Ionian Sea

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In the upper layers of the Ionian Sea, young Mediterranean Atlantic Waters (MAW) flowing eastward from the Sicily channel meet old MAW. In May 2017, during the PEACETIME cruise, fluorescence and particle content sampled at high resolution revealed unexpected heterogeneity in the central Ionian. Surface salinity measurements, together with altimetry-derived and hull-mounted ADCP currents, describe a zonal pathway of AW entering the Ionian Sea, consistent with the so-called cyclonic mode in the North Ionian Gyre. The ION-Tr transect, located ~19-20°E- ~36°N turned out to be at the crossroad of three water masses, mostly coming from the west, north and from an isolated anticyclonic eddy northeast of ION-Tr. Using Lagrangian numerical simulations, we suggest that the contrast in particle loads along ION-Tr originates from particles transported from these three different water masses. Waters from the west, identified as young AW carried by a strong southwestward jet, were intermediate in particle load, probably originating from the Sicily channel. Water mass originating from the north was carrying abundant particles, probably originating from northern Ionian, or further from the south Adriatic. Waters from the eddy, depleted in particles and Chl-a may originate from south of Peloponnese, where the Pelops eddy forms.

The central Ionian Sea hence appears as a mosaic area, where waters of contrasted biological history meet. This contrast is particularly clear in spring, when blooming and non-blooming areas co-occur.

High resolution measurements reveal a high heterogeneity in properties such as particles abundances. To interpret these distributions, combination of multiparametric *in situ* measurements with remote sensing and Lagrangian modeling appears necessary.