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GOCE-only geostrophic circulation in the Mediterranean Sea

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The Mediterranean Sea is a challenging basin for the exploitation of GOCE data because the geostrophic circulation is characterized by scales shorter than 100 km, thus smaller than the spatial resolution of GOCE. Furthermore, the amplitude of the geostrophic velocities is much lower than in open oceans. The goal of this work is to compute a Mean Dynamic Topography (MDT) that, depending only on the GOCE geoid without any other gravity information, emphasizes the actual contribution of the GOCE mission to the Mediterranean Sea stationary circulation. The filtering procedure is based on a least-squares collocation approach, locally adapting the signal and error covariance functions to the Mediterranean Sea characteristics. Geostrophic velocities have been computed consistently with the MDT. Statistical tests to detect where the obtained GOCE-only circulation is in agreement with the circulation found in literature have been developed. This study has been performed in the framework of the STSE-ESA MEGG-C project.