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Waves and Marine Currents Characteristics Along the Western Black Sea Coast

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The paper presents a detailed analysis of the surface wave regime at Constanta site and of the current regime using the measurements from the seasonal cruises along the Western Black Sea shore, about 30 miles seaward. The measurements of the sea currents performed during 2011 - 2012 in 138 oceanographic stations along the Romanian Black Sea Coast (245 km long) and 55km offshore were analyzed. The water masses circulation along the Romanian shore is north to south, the current speeds ranging from 50 cm/s at the surface to 5 cm/s in the bottom layer, depending on winds and the location of oceanographic station. Different mesoscale features are present in the surface current patterns. The monthly average values of the wave parameters consist in three daily observations of wave type (sea or swell), direction, height (m), period (s) and length (m) of the waves at 12m water depth, measured by detecting the vertical movement of a surface buoy. The wind speed and direction were measured with automatic weather station, at Constanta meteorological station (44o14' N, 28o38' E) and Gloria Oil Rig (44o31' N, 29o34' E) sites. Significant changes in the long term evolution (1971 – 2010) of the wave characteristics are mainly due to meteorological factors that have a considerable time variability The annual average of calm sea (wave height less than 0.2m - detection limit of the measurement method), is about 60%, the wave average period is approximately 4.5s and average height of about one meter, resulting in an overall average height of about half a meter for the entire period. In winter season (December to March) the state of the sea, in Beaufort Force scale, is greater than 3 and the maximum measured wave height in 40 years is 6 m.