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\textbf{Seasonal-scale nearshore morphological evolution of Romanian coast }

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The Romanian coast has been subject to serious beach erosion problems since decades. The northern unit, the deltaic coast of the Danube, is most affected. In the last 35 years the shoreline has retreated inland between 180 to 300 meters and 80 ha/year of the beach has been lost. Hydrotechnical works on the Danube and its tributaries have resulted in serious decrease of Danube sediment load, imposing negative consequences on the littoral sediment balance. In addition, hydrotechnical and harbour works intercept the longshore drift, leading to a decrease of the littoral sediment budget and acute erosion. Different types of protection works have been built in the southern part of the coast, which was the most affected by erosion.

The Romanian Black Sea coast is divided into two management units: The *northern unit* which is the deltaic coast of the Danube running from the Chilia Branch to Cap Singol and the *southern unit* extending to Vama Veche at the border with Bulgaria. The coast covers the port areas Midia, Constanţa and Mangalia as well as the touristic beaches of Mamaia, Eforie, Constineşti and Mangalia. In total, the Romanian coastline measures approximately 230 km.

The shoreline analysis along the Romanian coast has been performed by utilizing aerial photographs to reveal the different behavior between left and right side of the cap Media. The shoreline in the south sector has been moving more dynamically than the north sector. In an attempt to improve data treatment and interpretation, Empirical Orthogonal Function (EOF) statistical analysis was performed for southern Romanian beach profile data. The efficiency of the method for analysing the data was evaluated and compared with previous similar works.

(EOFs) or principal components were used to extract the significant modes of shoreline variability from several data sets collected at three very different locations. Although EOFs have proven to be a valuable tool in the analysis of nearshore data, most applications have focused on the ability of the technique to describe cross-shore or profile variability. Here however, EOFs were used to help identify the dominant modes of longshore shoreline variability at several beachs.

The analysis separates temporal and spatial dependences of the data allowing the description of beach changes as a linear combination of time and space functions. Irregulary time sampled seasonal data yielded worse results than the more regular daily profile observations. Most of the variations in profile configuration were explained by the first three eigenfunctions corresponding to the three largest eigenvalues. The largest eigenvalue corresponded to an eigenfunction which represented an average profile. The second eigenfunction showed a maximum at the berm location and tended to have a minimum towards the lower terrace. The third eigenfunction showed a minimum at the berm, tending to have a maximum near the terrace location. Results indicated that the method can be usefull tool for analysing Romanian shoreline data. It provides a way of interpreting profile variation behavior and the governing physical processes.