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# Role of shore platforms on coastal cliffs protection in Algarve (South Portugal): First approach

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The complex interaction between morphogenetic processes acting on rocky coasts and substrate characteristics difficult the assessment of its evolution at different time scales. In opposition to other coastal environments such as beaches, where variations on substrate's attributes are constrained to a few possibilities, rocky coasts expose substrates having large amount of variables, among them, lithology, mechanical and chemical strength, density and orientation of faults and joints and, rocks' texture and structure (e.g., Trenhaile, 2003). Waves represent the most important energetic source on coastal areas and, abrasion, hammer effect and air compression in rocks discontinuities are the main mechanisms responsible for mechanical weathering induced by wave impact (e.g., Trenhaile, 1987, Sunamura, 1992). Shore platforms are the most conspicuous testimony of rocky cliffs recession. However, as shore platforms widen, cliffs foot rests out of the direct influence of breaking waves when sea level rise is slower than cliff retreat. Shore platforms have been reported as protective features against marine erosion by dissipating waves energy, its efficacy depending on height and slope (e.g., Porter et al., 2009; Trenhaile, 2010). The main objective of this work is to determine the role of shore platforms on cliffs protection at the Algarve (South Portugal) as monitored in two coastal sectors differently exposed to dominant waves.

Coastal cliffs in the study area expose Miocene carbonate rocks with vertical facies variation between sub horizontal layers of calcarenites and siltstones, which represents a favourable geological context to the shore platform development. Waves height and period was measured along 12 months during spring tides and in some storm events by using pressure transducers. For that, pressure transducers were fixed into the rock in two coastal sectors positioned in both places at similar heights above mean sea level respectively for outer and inner edges of shore platforms. Internal data logger recorded the complete wave spectra, with measurements at each four seconds during one tidal cycle or more (in order to catch storm conditions). The wave height and period was extracted in post-processing of the collected data. Several parameters were also quantified, e.g., wave energy and power. Cross-shore topographic profiles were performed for both sectors by using a Differential Global Position System (DGPS).

Incoming waves are from SSW (232º) during ca. 90% of the year and was the only situation observed during measurements. Frequency of waves height in break zone lower than 0.8m represented ca. 90% and 50% for the more sheltered and the more exposed sector respectively. Higher waves heights were registered only during winter in storm conditions. The value of 0.8m for wave height in break zone acts as a threshold that separates different role of the shore platform on waves propagation. Platform acts in a dissipative way above that threshold, with a landward decreasing of the significant wave height, energy and wave power. In oposition, energy and wave power increase landward when approaching waves are lower than 0.8m. These differences can be justified trough the interaction between waves propagation and depth of water column.

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