

USE OF GPR TO CHARACTERIZE AN ANCIENT EOLIAN DEPOSIT OF THE BOTUCATU FORMATION, PARANA BASIN, BRAZIL

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A ground-penetrating radar (GPR) survey was performed on ancient eolian deposits of the Botucatu Formation, Paraná Basin, southern Brazil, to establish the internal structures formed by dune migration. In this study, frequency of 50 MHz were used and the radar transect run parallel and perpendicular to maximum slope of foresets of ancient dune. The resulting stacked radar cross-section illustrate the general attitude of reflectors to a depth of approximately 15 m. It was recognized two types of depositional surfaces: cross-bedded sets and third-order bounding surfaces. In the dip section, cross-bedding is parallel, continuous and sloping. The third-order bounding surfaces, interpreted as reactivation surfaces, were defined by identification of reflector terminations and truncations on GPR data beyond outcrop description. In the strike section both cross-bedding and third-order bounding surfaces are subhorizontal. Analysis of bounding surfaces and attitudes of reflectors in the cross-section allowed to infer the occurrence of the two-dimensional, crescentic dune that underwent cyclic fluctuations. Thus, it is possible to draw a comparison to computer simulations in order to suggest an interpretation for such structures. In the present case, the third-order bounding surfaces can be related with surfaces developed in bedforms that fluctuate in migration speed and asymmetry or that undergo small but rapid fluctuations in height.