



## **Pockmark asymmetry and seafloor currents in the Santos Basin offshore Brazil**

Uri Schattner (1) and Michel Michaelovitch de Mahiques (2)

(1) Dept. of Marine Geosciences, Charney School of Marine Sciences, University of Haifa, Haifa, Israel (schattner@univ.haifa.ac.il), (2) Oceanographic Institute of the University of São Paulo (IOUSP), São Paulo, Brazil

Pockmarks form by gas/fluid expulsion into the ocean and are preserved under conditions of negligible sedimentation. Ideally, they are circular at the seafloor and symmetrical in profile. Elliptical pockmarks are more enigmatic. They are associated with seafloor currents while asymmetry is connected to sedimentation patterns. This study examines these associations through morphological analysis of new multibeam data collected across the Santos continental slope offshore Brazil in 2011 (353 – 865 mbsl). Of 984 pockmarks, 78% are both elliptical and asymmetric. Geometric criteria divide the pockmarks into three depth ranges that correlate with a transition between two currents: the Brazil Current transfers Tropical Water and South Atlantic Central Water southwestwards while the Intermediate Western Boundary Current transfers Antarctic Intermediate Water northeastwards. It is suggested that the velocity of seafloor currents and their persistence dictate pockmark ellipticity, orientation and profile asymmetry. Fast currents (>20 cm/s) are capable of maintaining pockmark flank steepness close to the angle of repose. These morphological expressions present direct evidence for an edge effect of the South Atlantic Subtropical Gyre and, in general, provide a correlation between pockmark geometry and seafloor currents that can be applied at other locations worldwide.