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## Active transpression along the Owen oceanic transform fault, India - Somalia plate boundary

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The Owen oceanic transform fault is a 300-km long linear structure connecting the Carlsberg and Sheba spreading centers in the northwest Indian Ocean. It presently forms with the Carlsberg ridge the active plate boundary between India and Somalia. The Owen transform fault accommodates the left-lateral strike-slip motion between India and Somalia at a rate of about 23 mm/yr. Firstly identified by Tuzo Wilson in the 60s, this oceanic transform remains poorly described. The fault was recently surveyed in the Spring of 2019 during the VARUNA and CARLMAG cruises (<https://doi.org/10.17600/18001108>, <https://doi.org/10.17600/18000872>) along its entire length aboard BHO Beautemps-Beaupré, an oceanographic ship operated by the French Naval Hydrographic and Oceanographic Services (SHOM) and the French Navy.

During these missions a set of high-resolution seismic lines (>5000 km) were acquired together with high resolution multibeam bathymetry. The data cover both the active and fossil traces of the transform fault between 9°N and 15°N, at a place where continuous deposition of the distal Indus turbiditic sediments offers a unique high-resolution stratigraphic record of past regional tectonic events.

The new bathymetric mapping reveals two remarkable transpressive ridges on the active fault trace. A precise stratigraphic work using seismic profiles and drilling data of the ODP leg 117 allows the time calibration of the new seismic lines as far south as the Carlsberg ridge.

We show that a major compressive event occurred on the Owen Oceanic Transform Fault recently between 1.5 Ma and 2.4 Ma. Compression is still active today as evidenced by Sub-bottom profiler data (3.5 kHz) and two compressive focal mechanisms found in the historical seismicity records. At the intersection with the Carlsberg ridge, the southern transpressive ridge bends and stands ~1200 m above the seafloor at its apex, suggesting a maximum surrection rate near 800 m/Ma. These new geophysical dataset combined with previous cruises offers an unprecedented window on the recent evolution of the India-Somalia plate boundary.