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# Crustal Structure of Continental Margin and Oceanic Basin at the Southern Mozambique Margin

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During the Jurassic period, the Gondwana Continent progressively rifted from north to south along three huge transform faults (Davie Fracture Zone (DFZ), Mozambique Fracture Zone (MFZ) and Agulhas-Falkland Fracture Zone (AFFZ)), forming the northern, central and southern continental margins along Mozambique, producing a series of divergent and strike-slip margins. These margins are crucial areas for understanding the evolution of Gondwana as their crustal nature and geometry have strongly impacted the kinematic reconstruction of Gondwana. Especially, the debate about continental or oceanic crust for the Mozambique Coastal Plain (MCP) and North Natal Valley (NNV) at the southern Mozambique margin led to tens of kinematic reconstruction models of Gondwana. Based on the OBS and MCS data results of PAMELA MOZ3/5 Cruises, MCP and NNV were identified as continental crust. This has led the scientific community to reconsider the issue, for example, the opening time of the oceanic basin, the movement direction of rifting, and the intense magmatism during the rifting and break-up of Gondwana.

In June 2021, the Second China-Mozambique Joint Cruise was conducted onboard the R/V "Dayang hao". Three wide-angle seismic OBS profiles were acquired where 70 four-component OBSs were deployed along profiles DZ02 and DZ04 oriented nearly W-E and DZ01 oriented nearly N-S. Four Bolt air guns with a total volume of 8000 in$^3$ in total were towed at ~100 m behind the R/V "Dayang hao" at ~10 m below the sea surface. The shot interval was 200 m.

Here, we present the tomographic results of P-wave velocity along 442 km long profile DZ02, where 21 OBSs were deployed. It traverses through the Continent Ocean Transition (COT) and extends into the Mozambique ocean basin. Approximately 19,000 P-wave arrivals were manually picked, using the travel-time tomography inversion to get the velocity model. The tomographic result shows an apparent decrease in crust thickness from COT to the ocean basin, and the thickness of the oceanic crust is about 8 km. We also observe high-velocity anomalies up to 7.4 km/s in the lower crust above Moho, suggestive of more primitive melt. We will also present the S-

wave velocity model for DZ02.