



Comparison of South China Sea and SW Iberia Continent-Ocean Transition Zone

Li Yaqing (1), Li Chunfeng (1,2), Pinheiro Luis (3), Neres Marta (4,5), Wang Yingmin (1), Terrinha Pedro (4,5), and Zitellini Nevio (6)

(1) Department of Marine Sciences, Zhejiang University, Zhoushan 316021, China (liyaqing@scsio.ac.cn), (2) Laboratory for Marine Mineral Resources, Qingdao National Laboratory for Marine Science and Technology, Qingdao 266237, China, (3) Departamento de Geociências e CESAM, Universidade de Aveiro, Campus Universitário de Santiago, 3810-193, Aveiro, Portugal, (4) Portuguese Institute for the Sea Atmosphere (IPMA), Lisbon, Portugal, (5) Instituto Dom Luiz, Lisbon University, Portugal, (6) Istituto di Scienze MARine, Sezione di Geologia Marina, CNR, Via P. Gobetti 101, 40129 Bologna, Italy

Precise calibration of the continent-ocean transition zone (COTZ) in South China Sea (SCS) based on reflection seismic data and field geophysical gravity data indicates that the OCTZ in the South China Sea is a narrow zone about 10-20 km wide, where oceanic crust directly abuts the continental structure, the free-air gravity is approximately zero and the Moho reflector is discontinuous. The COTZ here is narrower than in other non-volcanic continental margins, which raised the question whether there is exhumed mantle in SCS or not. IODP367 drilled the COTZ and no exhumed mantle was found but continental crust instead.

The Gorringe Bank in SW Iberia straddles across the COTZ for approximately 200km. The Gorringe Bank has been the object of various studies, such as reflection and refraction seismics, dives in manned submersibles and drilling by DSDP 120. From these studies it is thought that it consists of partially serpentized mantle that was exhumed during the continental rifting stages and later uplifted by a NW-wards directed lithosphere thrust of Miocene age in response to Africa-Eurasia plate convergence. These data show the presence of syn-rift structures along Eastern flank of Gorringe and of serpentized continental mantle overlain by deep water sediments of Early Cretaceous age at the top of Gorringe Bank. Towards the Ocean Crust (West Gorringe) the extensional tectonic structures are still preserved and it is presumed that deep basin sediments lie on top of oceanic crust which lies on top of oceanic mantle.

In this work we compare SW Iberia and South China Sea COTZs, in particular i) the tectonic style of the upper crust and the basin sediment record, from pre-rift to the break up unconformity and post rift sequences, ii) the deep structure from crust to mantle across the Moho on both continent and ocean sides of the COTZ. We aim to discuss the occurrence of serpentized mantle in SW Iberia against their lack SCS, both non-volcanic rifted margins. This work is based on reprocessing of IAM and ARRIFANO multichannel seismic profiles across the Gorringe Bank and their comparison with seismic data in the South China Sea, as well as on analysis of gravity and magnetic data.

Publication supported by the PRORIFT Project (RIFTING PROCESSES AND LITHOSPHERIC STRUCTURE AT THE OCEAN CONTINENT TRANSITION IN THE SOUTH CHINA SEA AND THE WEST IBERIA MARGIN - NSFC/0003/2016), and FCT- project UID/GEO/50019/2019 - Instituto Dom Luiz