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Object: Submission of a new manuscript to Geochemistry, Geophysics, Geosystems

Dear Editor,

Please find enclosed our manuscript entitled “Crustal structure of the Northeast South China Sea rifted margin”, which we would like to submit for publication in Geochemistry, Geophysics, Geosystems with my co-authors, Julie Tugend (Commission for the Geological Map of the World), Geoffroy Mohn (CY Cergy Paris Université), Nick Kusznir (University of Liverpool) and Liang-Fu Lin (National Taiwan University).

In our manuscript, we investigate the crustal structure and basement nature of the Northeastern South China Sea (NE SCS) distal margin. To this end, we adopted an interdisciplinary approach. We interpreted seismic data, conducted geophysical analyses (3D gravity-inversion and joint inversion of seismic and gravity Moho), and compiled petrological and geochemical observations from drilling results. Our results provide new regional constraints to determine crustal thickness variations in the NE SCS. The results of our joint seismic-gravity inversion allow us to determine lateral density variations along a set of seismic profiles.
We show contrasted crustal thickness variations from north to south from the proximal to the unambiguous oceanic domain. We notably constrain the dense properties of the distalmost part of the NE SCS, interpreted as polygenic crust recording poly-phase magmatic activity since the Mesozoic, with potentially significant activity during Cenozoic post-rift time. These results are integrated into the framework of the SCS rifting that developed over a previous Mesozoic active continental margin. The characterization of the former Mesozoic paleogeography allows us to suggest that the suture between the Eurasia continental and Luconia microcontinent might have acted as a preferred zone for the Cenozoic rift development of the SCS.

We believe that our manuscript is of broad interest and will stimulate discussions not only regarding the South China Sea geodynamic system but also regarding the impact of inheritance on rift initiation.

Our manuscript has not been published elsewhere nor is it under review by another journal. All authors have approved the manuscript and agreed with its submission to this journal.
We also look forward to receiving feedback from both the editor and the reviewers.

On the behalf of my co-authors,
Yours sincerely,
Mateus Rodrigues de Vargas,
Cergy-Paris Université