EGU21-16456
https://doi.org/10.5194/egusphere-egu21-16456
EGU General Assembly 2021


# Seismic Structure and Tectonic Evolution of Borneo and Sulawesi

**Harry Telajan Linang**[1], Amy Gilligan[2], Jennifer Jenkins[3], Tim Greenfield[1], Felix Tongkul[4], Sri Widiyantoro[5], and Nick Rawlinson[1]

[1]University of Cambridge
[2]University of Aberdeen
[3]Durham University
[4]Universiti Malaysia Sabah
[5]Institut Teknologi Bandung

Borneo is located at the centre of Southeast Asia, which is one of the most active tectonic regions on Earth due to the subduction of the Indo-Australian plate in the south and the Philippines Sea plate in the east. Borneo resides on the leading edge of the Sundaland block of the Eurasian plate and exhibits lower rates of seismicity when compared to the surrounding regions due to its intraplate setting. Sulawesi, an island which lies just southeast of Borneo, is characterised by intense seismicity due to multiple subduction zones in its vicinity. The tectonic relationship between the two islands is poorly understood, including the provenance of their respective lithospheres, which may have Eurasian and/or East Gondwana origin.

Here, we present recent receiver function (RF) results from temporary and permanent broadband seismic stations in the region, which can be used to help improve our understanding of the crust and mantle lithosphere beneath Borneo and Sulawesi. We applied H-K stacking, receiver function migration and inversion to obtain reliable estimates of the crustal thickness beneath the seismic stations. Our preliminary results indicate that the crust beneath Sabah (in northern Borneo), which is a post-subduction setting, appears to be much more complex and is overall thicker (more than 35 km) than the rest of the island. In addition, we find that crustal thickness varies between different tectonic blocks defined from previous surface mapping, with the thinnest crust (23 to 25 km) occurring beneath Sarawak in the west-northwest as well as in the east of Kalimantan.

We also present preliminary results from Virtual Deep Seismic Sounding (VDSS) in northern Borneo, where from the RF results we know that there is thick and complex crust. VDSS is able to produce well constrained crustal thickness results in regions where the RF analysis has difficulty recovering the Moho, likely due to complexities such as thick sedimentary basins and obducted ophiolite sequences.