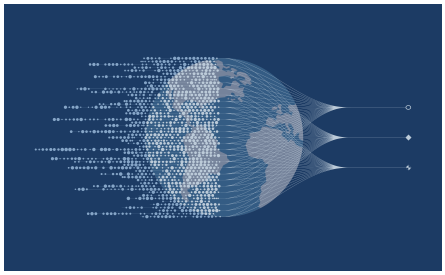

ID: **P1.2-373** Type: **E-poster**

Depth and Average Lithospheric Structure Beneath the Beni Suef-Siwa Sector, Egypt

This study focuses on understanding the crustal and upper mantle structure beneath northern Egypt using seismic data from 500 records collected by the Egyptian National Seismological Network (ENSN). Two broadband stations in the region were used to investigate crustal properties through joint inversion of surface wave dispersion curves (Rayleigh wave phase velocity) and receiver functions (RFs). Receiver function analysis, with the H-K stacking method, helped determine the Moho depth, crustal thickness, and the Vp/Vs ratio. The study yielded 1-D shear velocity models for the two areas of interest: Beni Suef (NBNS) and Siwa (SWA). The results complement the observations of RFs after performing H-K stack to obtain Moho depth across the area. Measurements from dispersion curves and RFs are used in Pesianoss joint inversion to retrieve a series of 1-D shear wave velocity models. The integration of both methods allows for complementary insights into the crustal thickness, composition, and velocity distribution. The crust beneath Beni Suef is characterized by three layers, with a thickness of 29.2 ± 1.3 km and a Vp/Vs ratio of 2.2 ± 0.07. In Siwa, the crust has three horizontal layers, with a thickness of 33.5 ± 2.2 km and a Vp/Vs ratio of 2.0 ± 0.09.

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Session Classification: P1.2 The Solid Earth and its Structure

Track Classification: Theme 1. The Earth as a Complex System: T1.2 The Solid Earth and its Structure