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Supporting Information for

# Crustal structure of the UAE-Oman mountain range and Arabian rifted passive margin: new constraints from active and passive seismic methods

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## Contents of this file

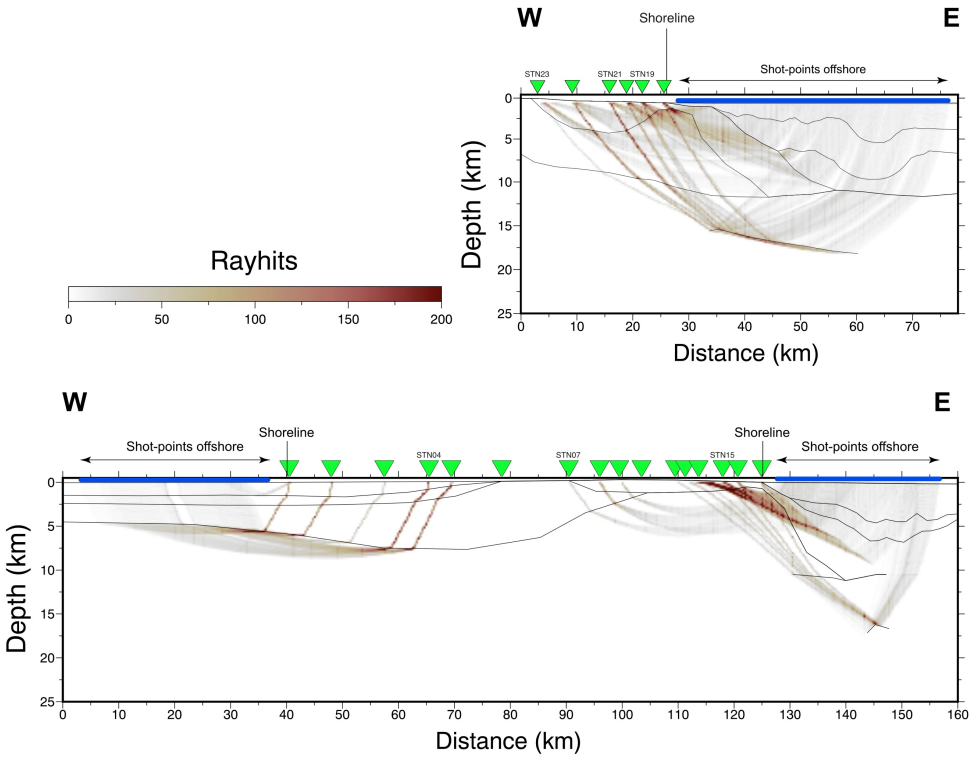


**Figure S1.** Ray density plot for Line D4 and D1. Cell size to compute the number of rays is 0.2 km horizontally and 0.1 km vertically. The corresponding velocity models are shown in Figure 7.

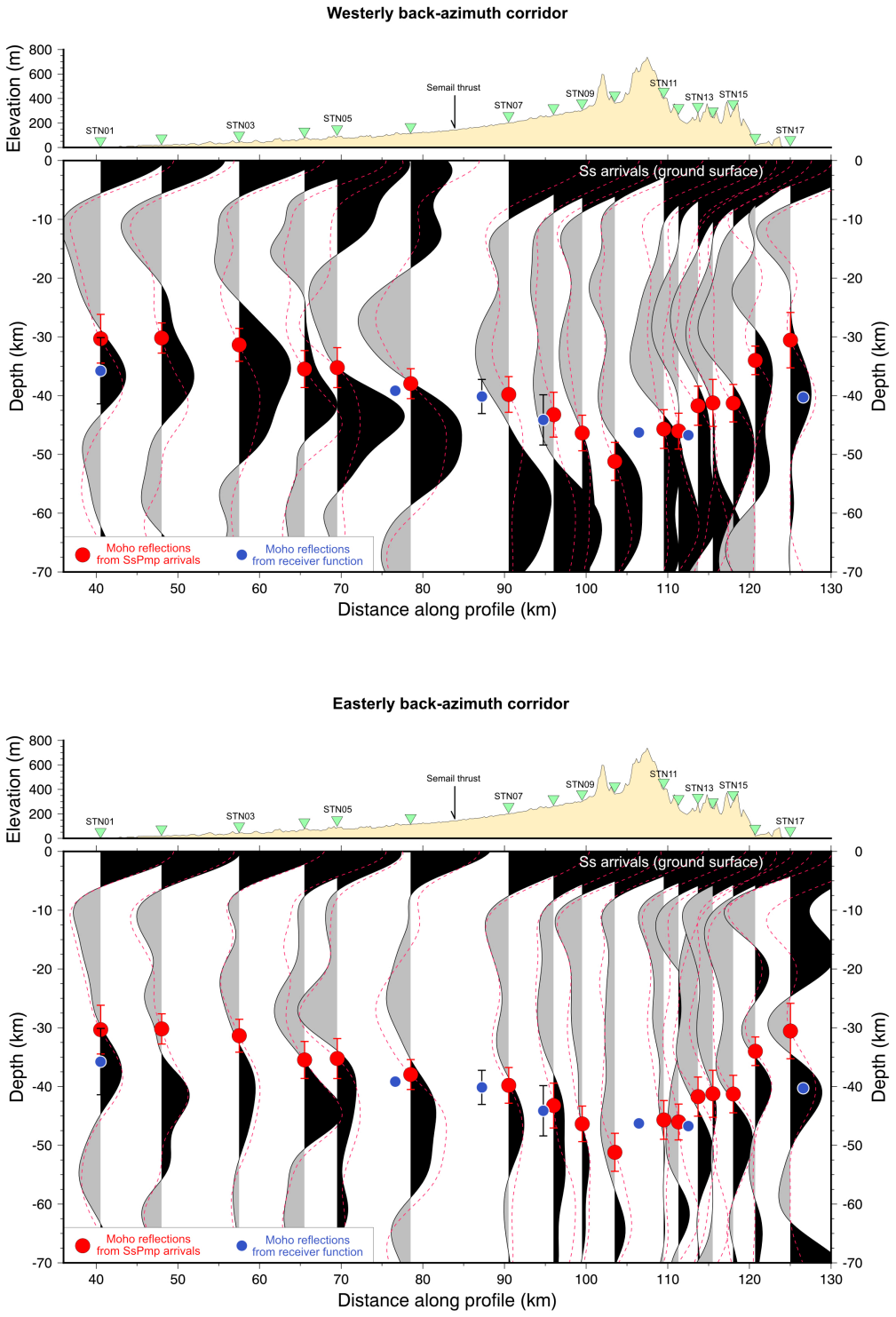


**Figure S2.** Depth-migrated 1-D reflection profiles for Line D1 constructed using sources from the westerly (top) and easterly (bottom) back-azimuth corridor only. Dashed line and red dots are obtained using the whole dataset as per Figure 8.

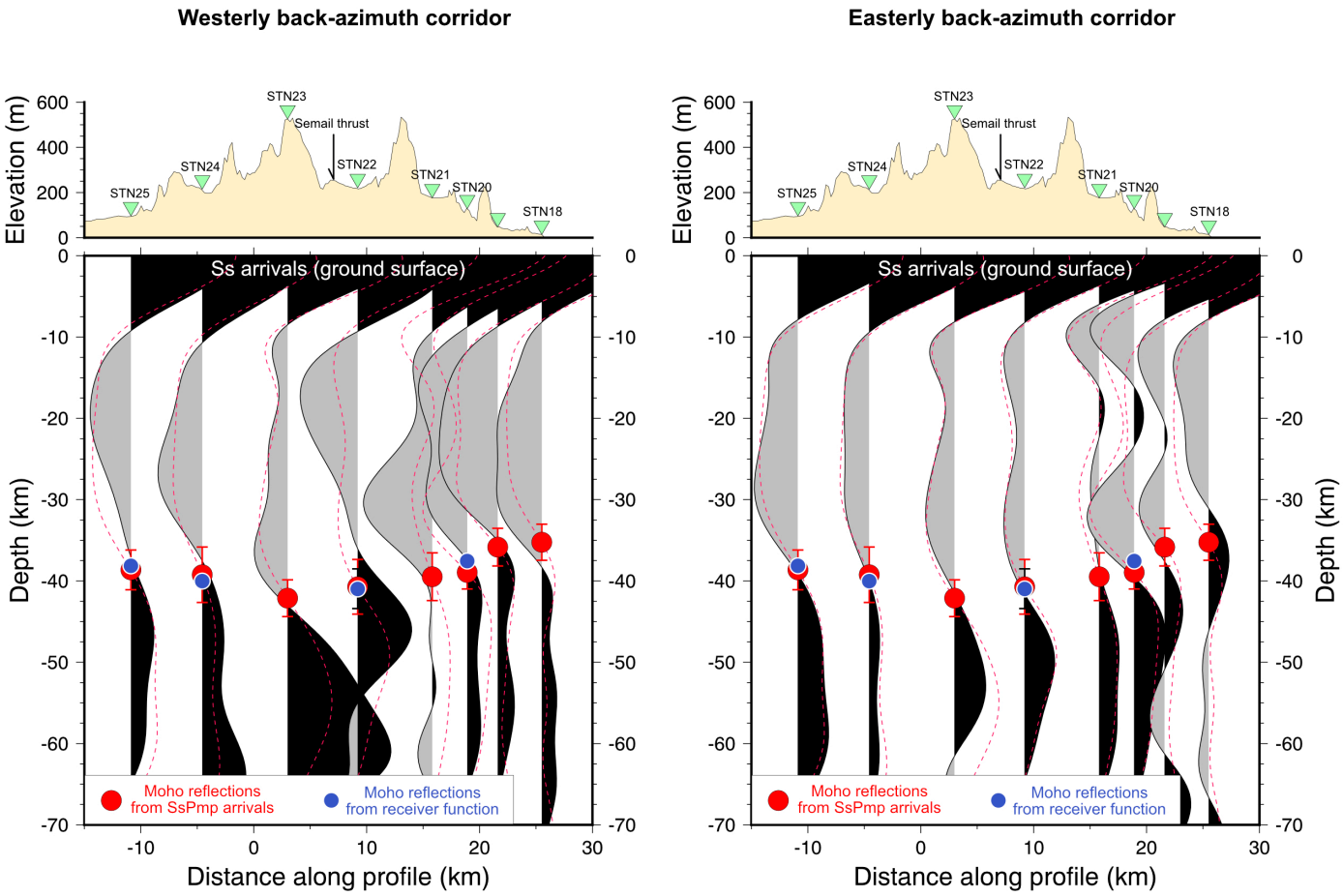


**Figure S3.** Depth-migrated 1-D reflection profiles for Line D4 constructed using sources from the westerly (top) and easterly (bottom) back-azimuth corridor only. Dashed line and red dots are obtained using the whole dataset as per Figure 8.

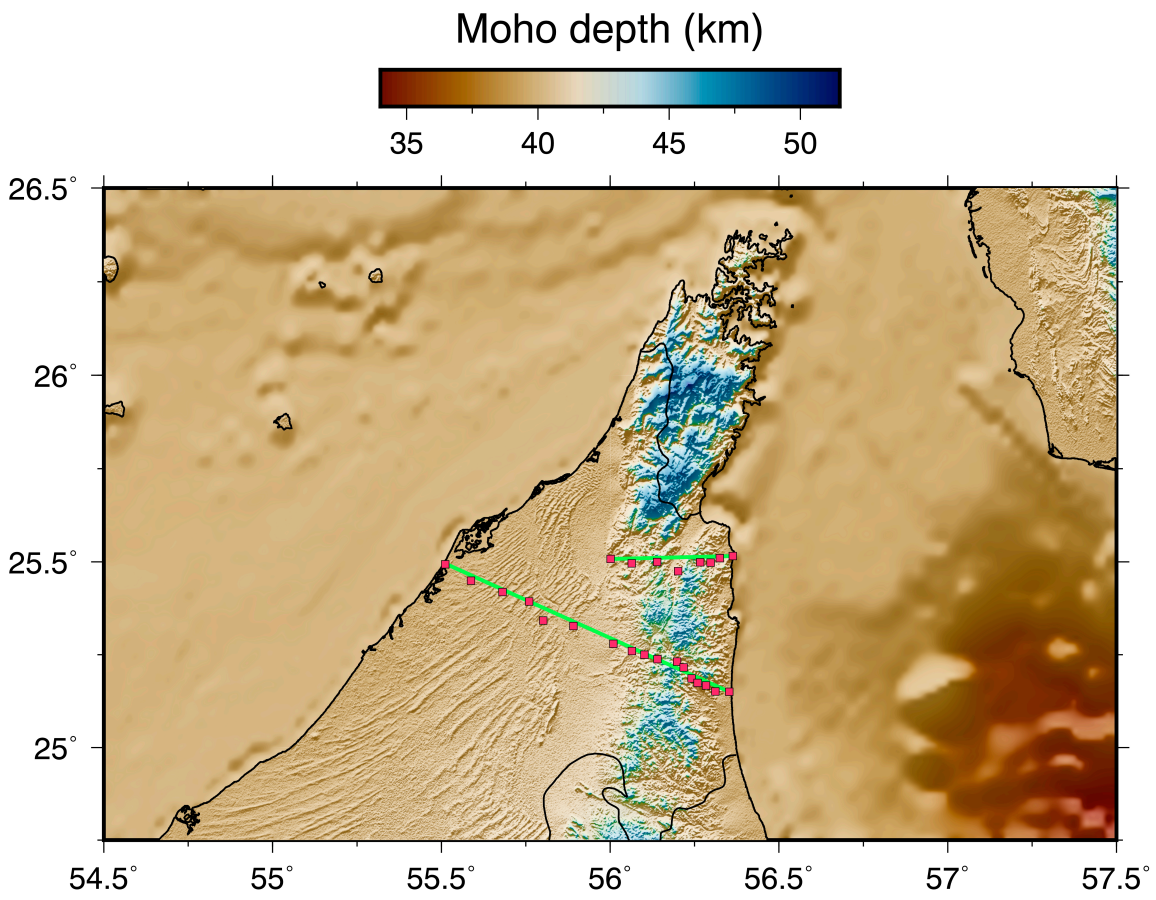


**Figure S4.** Depth to Moho computed using Airy isostacy. Model ETOPO1 (resolution ~900 meters) is used for bathymetry; model SRTM90 (resolution ~100 meters) is used for elevation onshore. Calculations assume a density of water, crust and mantle of 1030, 2800 and 3300 kg $m^{-3}$, respectively. Our reference model has no topography and crustal thickness of 40 km. Red squares are seismic stations used in this study. Location of the Airy depth-to-Moho profiles shown in Figure 8 are highlighted in green.

| Phase | Number of picks | RMS (ms) | $\chi^2$ | Profile |
|---|---|---|---|---|
| P1 | 455 | 87 | 0.8 | D1 |
| P2 | 680 | 178 | 1.2 | D1 |
| P3 | 778 | 151 | 1.4 | D1 |
| PmP | 253 | 190 | 0.9 | D1 |
| **Total** | **2207** | **147** | **1.2** | **D1** |
| P1 | 310 | 89 | 0.9 | D4 |
| P2 | 1076 | 140 | 1 | D4 |
| PmP | 459 | 120 | 0.7 | D4 |
| Pn | 236 | 120 | 0.7 | D4 |
| **Total** | **2081** | **120** | **0.8** | **D4** |

**Table S1.** *Traveltime fit information for profile D1 and D4*

| Station | Latitude | Longitude | Moho depth (km) | Uncertainty (km) | No. Traces | No. Traces (East) | No. Traces (West) |
|---|---|---|---|---|---|---|---|
| STN01 | 55.511 ˚N | 25.493 ˚E | 30.3 | 4.1 | 14 | 12 | 2 |
| STN02 | 55.587 ˚N | 25.449 ˚E | 30.2 | 2.5 | 12 | 7 | 5 |
| STN03 | 55.681 ˚N | 25.418 ˚E | 31.3 | 2.8 | 24 | 19 | 5 |
| STN04 | 55.760 ˚N | 25.393 ˚E | 35.4 | 3.1 | 12 | 7 | 5 |
| STN05 | 55.801 ˚N | 25.342 ˚E | 35.2 | 3.4 | 10 | 9 | 1 |
| STN06 | 55.891 ˚N | 25.327 ˚E | 37.9 | 2.5 | 13 | 10 | 3 |
| STN07 | 56.009 ˚N | 25.279 ˚E | 39.8 | 3.0 | 21 | 17 | 4 |
| STN08 | 56.064 ˚N | 25.259 ˚E | 43.2 | 3.8 | 16 | 10 | 6 |
| STN09 | 56.101 ˚N | 25.250 ˚E | 46.3 | 3.0 | 10 | 6 | 4 |
| STN10 | 56.139 ˚N | 25.238 ˚E | 51.2 | 3.2 | 14 | 9 | 5 |
| STN11 | 56.197 ˚N | 25.231 ˚E | 45.6 | 3.2 | 15 | 12 | 3 |
| STN12 | 56.217 ˚N | 25.215 ˚E | 46.0 | 3.0 | 10 | 4 | 6 |
| STN13 | 56.241 ˚N | 25.186 ˚E | 41.7 | 3.3 | 11 | 6 | 5 |
| STN14 | 56.258 ˚N | 25.174 ˚E | 41.2 | 3.9 | 10 | 6 | 4 |
| STN15 | 56.283 ˚N | 25.167 ˚E | 41.2 | 3.1 | 7 | 5 | 2 |
| STN16 | 56.311 ˚N | 25.151 ˚E | 34.0 | 2.4 | 11 | 9 | 2 |
| STN17 | 56.352 ˚N | 25.150 ˚E | 30.5 | 4.7 | 3 | 1 | 2 |
| STN18 | 56.363 ˚N | 25.515 ˚E | 35.2 | 2.2 | 13 | 7 | 6 |
| STN19 | 56.324 ˚N | 25.509 ˚E | 35.8 | 2.3 | 8 | 4 | 4 |
| STN20 | 56.297 ˚N | 25.497 ˚E | 38.9 | 2.0 | 10 | 6 | 4 |
| STN21 | 56.266 ˚N | 25.498 ˚E | 39.4 | 2.9 | 11 | 10 | 1 |
| STN22 | 56.201 ˚N | 25.474 ˚E | 40.7 | 3.3 | 10 | 9 | 1 |
| STN23 | 56.139 ˚N | 25.499 ˚E | 42.1 | 2.2 | 15 | 10 | 5 |
| STN24 | 56.064 ˚N | 25.495 ˚E | 39.2 | 3.4 | 18 | 15 | 3 |
| STN25 | 56.001 ˚N | 25.507 ˚E | 38.6 | 2.4 | 17 | 12 | 5 |

**Table S2.** Moho depth along profiles D1 and D4