Title: Crustal-scale structures and tectonic domains of the Kheis Tectonic Province in South Africa from multimethod seismic analysis
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RESPONSE TO EDITOR COMMENTS ACCOMPANYING MINOR REVISION
(All author responses to comments are formatted in bold blue)

Editor

Most of the reviewers' concerns were adequately addressed, but the multi-azimuth RFs continue to be under-utilized. Station SA22 lies 30 km north of the profile so diving rays arriving from the south will cross the Moho about 15-20 km closer to the profile than those arriving from the north. Key question here is whether the RF 'spikes' at 39 and 46 km each come predominantly from N or S and thus define a N-S slope to the Moho? Station SA23 lies on the profile so, similarly, do rays from the E and W cross the Moho at 33 and 38 (46??) km, respectively?

We have now added plots in the appendix of RF stacks that are binned in the four quadrants (north, south, east, west) and used this as an additional basis for discussion. The outcomes show that the RFs at SA22 exhibit a different waveform to the south, whereas at UPI and SA23, they are more uniform with respect to backazimuth. However, the number of RF in each bin varies, and therefore also the data quality. The bins with few events will not have as robust RF stacks as the bins with more events, which makes a direct comparison a little difficult, but it might still be illustrative for the reader. The updated discussion points in the text are found at lines 406-408; 427-428; 438-442; 450-455; 618-621. Figure 10 has also been revised to show rose diagrams plotted in degrees, not radians.

Consider whether the Dabep (like A, line 553) Thrust might represent an early, minor back-thrust to the main collision, later abandoned to deeper level extension as you currently suggest. Similarly, the Kalahari Line (line 506-514) might represent strain partitioning during convergence, with this vertical zone absorbing transverse strains during regional oblique convergence.

We agree that, given the belt-parallel kinematics and the presence of back-thrusting (e.g., Thrust A), an interpretation of the Dabep as an early, minor back-thrust is plausible. We have added some appropriate speculative text to the discussion (Lines 505-509).

Regarding the Kalahari Line, with its steep geometry and zone of seismic transparency, it is well-suited to have acted as a strain-partitioning structure during oblique convergence. Its geometry in the data (broad, vertically extensive zone of disrupted reflectivity) is consistent with an accommodation zone that absorbed transverse (strike-slip) strains.

We have incorporated this interpretation into the text (Lines 518-520) to highlight the possibility that the Kalahari Line played a role in partitioning deformation during

convergence.

line 50 Add Juhlin et al. this volume ref? (my role trying integrate papers within this special volume)
line 186 Transvaal and Olifantshoek Supergroup units crop out…
line 499 (Moen, 1999)

The respective additions/corrections have been implemented.