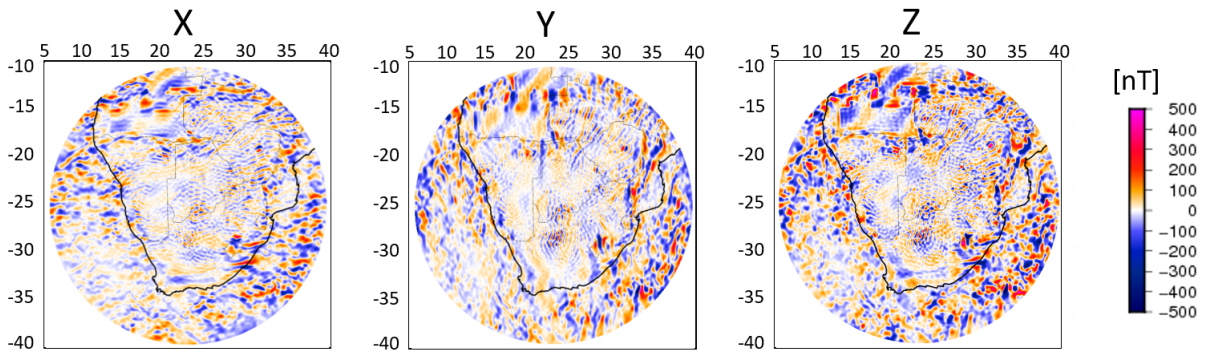

Figure 1: The X, Y and Z component of the residuals between our lithospheric field model and the EMM2017 model, plotted at the Earth's mean reference radius.

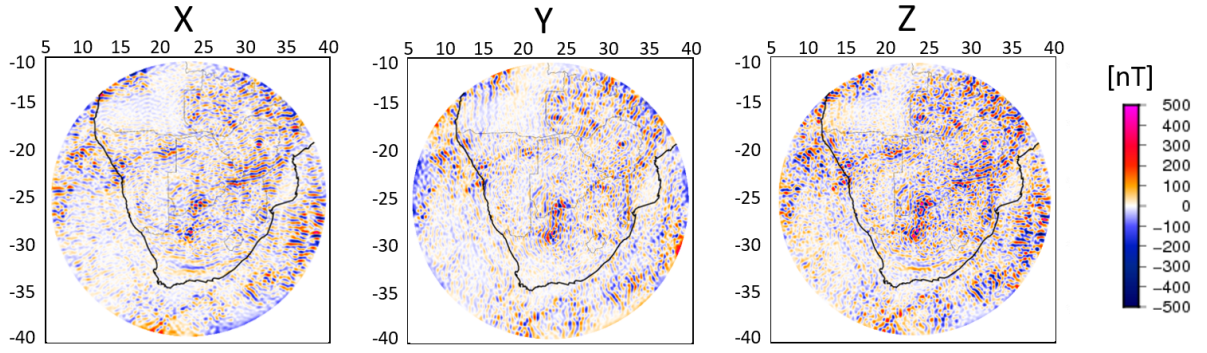

Figure 2: The X, Y and Z component of the residuals between our lithospheric field model and the WDMAMv2-SH800 model, plotted at the Earth's mean reference radius.

Reply to RC1

We would like to thank the reviewer for the encouraging comments.

Concerning the comment "But in this direction it would have been interesting to learn more about the interpretation of the new acquired field and how far it can reflect the magnetic effect of previously unknown structures." we would like to reply that as far as we can judge our model does not reflect previously unknown structures but does delineate more clearly structures already visible in existing models. In this respect, we present here the residuals between our model and the EMM2017 model (Figure 1) and the residuals between our model and the WDMAMv2-SH800 model (Figure 2).

Figure 1 is dominated by medium-scale patterns, which reflects the fact that our model carries more energy than the EMM2017 model over a large bandwidth. This is apparent already from Figure 6 of the manuscript. Figure 2 shows much smaller-scale features, as expected again based on Figure 6 of the manuscript. But even though the difference between our model and the WDMAMv2-SH800 is principally small-scale, our model describes in more detail several structures, e.g., the magnetic signature of the BIF over Botswana, the Damara Belt in Namibia and the southern border of the Zimbabwe

craton.

Keeping in mind that all three are just models, each with its own restrictions and uncertainties, we do not wish to present and discuss these residuals in the manuscript. We consider that our main point is sufficiently illustrated through Figure 6: our model does not dilute the magnetic signal the way the global models do because we do not need to regularize our solution.