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Nonlinear Processes in Geophysics
Discussions
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Interactive comment on "Full-tensor gravity gradient eigenvector analysis for locating complex geological source positions" *by* Boxin Zuo et al.

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The main problem is the definition of GTA: GTA = $\Phi Z^*[\tan\varphi]\beta \tan\varphi$ over the centres of mass of sources attains very large values.

This means that the GTA is an amplification filter of ΦZ. The authors implicitly think it plots edges of sources by using its contours, but in practice there is no way to choose one contour over others. In general, φ locates the centres of mass of the sources, and ΦZ has location and edge information. By multiplying them we lose information.

We could also define GGTA = $\Phi ZZ^*[\tan\varphi]\beta$ Following the authors scheme GGTA would then be better than the GTA in defining location and edges as ΦZZ is much better than ΦZ in defining location and edges.

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Finally, if β = zero then GTA = ΦZ*tanφ and you obtain an amplified ΦZ from which the edge information is mostly absent and if β = some very large value then GTA = ΦZ*β and the centre of mass information is mostly absent, this means that β is a "focussing" parameter: when far from sources it makes the GTA have information of only ΦZ as we get nearer to the top of sources it makes GTA almost totally dependent on φ. The edges get lost in this process, that is, they become dependent on β in an unpredictable way.

My recommendation is to reject the manuscript.

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