Dear Dr. Blichert-Toft and reviewers,

Thank you for your editorial work and reviews on our manuscript "Late-Cretaceous construction of the mantle lithosphere beneath the central California coast revealed by Crystal Knob xenoliths." I have substantially updated the text of the paper in response to your comments, which I found incredibly encouraging and helpful.

We understand that this paper is quite dense and broad in scope – and we thank you for your time in sifting through it in detail. We feel that G-Cubed is *the* ideal venue for this research since it integrates geochemistry, geophysics, numerical modeling and integrative geoscience. We have tried to build a picture of this research that can anticipate detailed critiques from the petrological, geodynamic, and seismological communities, which requires a full presentation of all sides of the data. Although we are sensitive to length concerns, we could not easily identify material to move to a supplementary section or remove. Although one reviewer suggested removal of our detailed treatment of the Monterey Plate stalled slab, we feel that explicitly dismantling the theoretical basis for this theory is crucial to strengthening our conclusion, and overdue in the literature.

Still, a persistent theme in all reviewers’ commentary was the sometimes-ponderous organizational scheme, particularly in the integrative middle of the paper. This did hurt the clarity and readability of our work, and I did the best to address it by substantial reorganization of the material introducing tectonic scenarios. This had the benefit of removing quite a bit of repetition, and the overall manuscript is about 60 lines (~5%) shorter. Other sections were less substantially shortened, but reworked for clarity. I believe these features have made the manuscript significantly clearer:

* Moved heat flow discussion and depth constraints section to separate “**3. Geothermal Constraints on the Deep Lithosphere**” section
* Shortened “**4. Origin of the mantle lithosphere beneath the Coast Ranges**” substantially to only deal with basic tectonic scenarios
  + Moved detailed debunking of Monterey plate to the end, after modeling section (**6.1 Geodynamic implausibility of the Neogene stalled slab**). This allowed us to centralize and economize that discussion.
  + Each subsection now corresponds directly to the groups by which we refer to the scenarios (i.e. slab window, stalled slab, and Cretaceous duplex)
* Shortened **6.3 The timing of the Crystal Knob eruption** to remove some confusing and conceptually weak material

One reviewer made the related point that discussion, results, and methods were sometimes mixed confusingly. Although we feel that the unusual organization scheme of the paper is natural and appropriate for a project with such a disparate set of methodologies, we responded by building more explicit walls between methods, results, and discussions. We did this both by adding textual cues and reorganizing within sections, and pulling discussion into their own sub-sections where applicable. We also renamed several sections to “**Discussion of xxx**” to better guide the reader through our progression.

We also fixed figure order and referencing, added several missing figure labels and caption information, and put the manuscript in the format expected by the journal.

Please find in this paper the revisions, a document containing detailed responses to reviewer comments, a tracked-changes word file of the text, and a AGU-formatted manuscript (with supplement in a separate file). The line numbers are substantially different from my original submitted version, so apologies for that.

Many thanks,

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