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Interactive comment on "Analysis of crustal deformation and strain characteristics in the Tianshan Mountains with least-squares collocation" *by* S. P. Li et al.

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On behalf of my co-authors, we thank you very much for giving us an opportunity to revise our manuscript, we appreciate you very much for your positive and constructive comments and suggestions on our manuscript entitled "Analysis of crustal deformation and strain characteristics in the Tianshan Mountains with least-squares collocation".(MS No.: se-2015-106). Those comments are all valuable and very helpful for revisin and improving our paper, as well as the important guiding significance to our research. We have studied your comments carefully and have tried our best to revise our manuscript according to the comments. The main corrections in the paper and the responds to your comments are as flowing:

Referee #1's Comments: A new scheme of interpolation is presented and applied. This is fine by me except the velocity field is reproduced in very few places (Figure 3).From here it is difficult to go further.

Authors' Answer: In the revised manuscript, we will add new data sets and we believe that it will make the results more accurate and can reflect the change of crustal deformation in recent years.

Referee #1's Comments: Why do we have compression event while the lithosphere is being extended (Figure 5)? I have the same comment about the shear rate map, why is there so many events (strike-slip, near N35; E85) where there is no shear detected?

Authors' Answer: The results of surface expansion and maximal shear strain reflect the crustal deformation characteristics of active blocks in a long time span and large scale. However, the earthquake focal mechanism express the dislocation direction between faults hanging wall and footwall during a relative short time and scale. So we cannot conclude that there must be not compression event in the place where the lithosphere is being extended. It should be noted that the maximal shear strains in the vicinity of the Kunlun Mountains (right-bottom corner of Fig. 4,near N35;E85) are lower. However, seismic activity in this region is hyperactive; for example, a large earthquake (Ms = 8.1) struck the Kunlun Mountains in 2001 (Zhang et al., 2003). The most likely reason for the discrepant results is that there are no observation stations distributed in this region and this leads to distortion of analog values. Therefore, the calculated results in this region were not considered in further analyses.

Referee #1's Comments: I recommend the authors to redo their strain rate computation before interpreting their results again.

Authors' Answer: We really appreciate the author's suggestion, we will add new data and redo the strain computation.

Interactive comment on Solid Earth Discuss., 7, 3179, 2015.