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## ***Interactive comment on “Multi-quadric collocation model of horizontal crustal movement” by G. Chen et al.***

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On behalf of my co-authors, thanks a lot for your positive and constructive comments and suggestions on our manuscript. Those comments are all valuable and very helpful for revising and improving our paper, as well as the important guiding significance to our research. The responds to your comments are as flowing:

Short Comments (1): Some of sentences are too long, for example: 1.a: In Abstract, “To establish the horizontal . . . must be carefully constructed” is too long. The sentence can be modified as “To establish the horizontal crustal movement velocity field of the Chinese mainland, a Hardy multi-quadric fitting model and collocation are usually used. However, the kernel function, nodes and smoothing factor are difficult to determine in

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the Hardy function interpolation. Furthermore, the covariance function of the stochastic signal must be carefully constructed in the collocation model, which is not trivial.” 1.b: In Introduction, “For simply fitting : : : smoothing factor and node” is too long and not smooth. The sentence can be modified as “The multi-quadric functions (Hardy,1978) can be used for fitting the parameters of measured points and estimating the parameters of unmeasured points. The mathematical methods are used in this case, while their physical meaning is not clearly considered. The key issues and difficult problems in their application are the choice of kernel function, smoothing factor and node.” 1.c: P3370, those sentences with Scheme1-4 need to be further smoothed.

Authors’ Reply: We have corrected the sentences listed in comment 1.a and 1.b in the revised text. We are very sorry for our abrupt style of writing for the sentences with Scheme 1-4 in page 3370. Those sentences have been rewritten in the revised text.

Short Comments (2): 2) Some others minor issues 2.a: P3362, Line 21: “ $n \times 3$ ” should be “ $2n \times 3$ ”, according to Eq.3 2.b: P3362, Line 22: “station quantity” may be “station number” 2.c: P3363, Line 5: “easterly” -> east; Line 6: northerly -> north 2.d: P3365, Line 7: the error equation -> the observation equation 2.e: P3368, Line 16: “calculated by different functions”, what are the “different functions”?

Authors’ Reply: We are very sorry for our negligence of minor details when editing the equation, we have corrected the responding words and expressions. The right form of words and expressions will be marked in red color in the revised version. In P3368, Line16, “different functions” here means “different schemes”. The word “functions” has been replaced with word “schemes”.

Short Comments (2): 3) Maybe the manuscript could include the estimated velocity field of mainland China, as it is the main result of the manuscript?

Authors’ Reply: Our main motivation in this manuscript is to verify the precision and validity of Multi-quadric collocation model proposed in this paper when estimating velocity field. The velocities of a set of 1070 reference stations were obtained from the Crustal

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Movement Observation Network of China, and the corresponding velocity field established using the new combined estimation method. A total of 85 reference stations were used as check points. We did not concentrate on analyzing the characteristics of estimated velocity field of Chinese mainland. As the reason mentioned above, we did not think that it is very necessary to include the estimated velocity field in the manuscript.

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Interactive comment on Solid Earth Discuss., 7, 3359, 2015.

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