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Interactive comment on “Elastic envelope inversion using multicomponent seismic data without low frequency” by C. Huang et al.

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Thanks a lot for your comments. In oil/gas seismic exploration, it is true that most inversion methods can do nothing to recover the long-wavelength components of the model when the traces spread extends only 50m and the data contents below 20hz is cut off. What we really want to say is that our envelope method is better than conventional EFWI in retrieving the long-wavelength components of the model in common situation. As we mentioned in the introduction of our paper (Page 4, line 20), in modern seismic exploration, the low frequency missing in the data is always around 5~6HZ, and that is why we always filtered out the data below 5 or 6HZ in the numerical tests of our manuscript. About the long offset data, we also have positive comments on its contribution to recover the background of the subsurface model in our manuscript (Page

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4, line 5 to line 7). Just for simplification reason, we did not repeat those limitations in our conclusion part, and your advice remind us it may cause misunderstanding, so we shall reclaim such constrains in our revised paper. Although your simple proof is an extreme example, it seldom happens in oil/gas seismic exploration. Anyway, it is still an interesting question. It inspires us to find in what extreme situation that our envelope method can still behave better than conventional EFWI in recovering the long-wavelength components of the model. According to your doubts, we are now doing a series of numerical tests to discuss the relationship among the effectiveness of our envelope method, the minimum threshold offset of the data and maximum threshold filtered low frequency. It will take us about one week to finish these tests and we will present the results later as an appended reply as soon as possible. Thanks again!

Interactive comment on Nonlin. Processes Geophys. Discuss., 1, 1757, 2014.

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