# *Interactive comment on* "Elastic envelope inversion using multicomponent seismic data without low frequency" *by* C. Huang et al.

## Anonymous Referee #1

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*"After envelope transform, most energy of the corresponding envelope are concentrated on ultra-low frequencies zone. With the benefit of these strong ultra-low frequency information, the long-wavelength components of the subsurface model can be well recovered by elastic envelope...."*

The simple proof that their claim is wrong is to take 10 traces spread out over 5 meters, eliminate the frequencies below 20 Hz. No way their method will recover long-wavelength components of the model down to kilometers in depth. According to their general claim, authors claim above example will recover long wavelength components. Author don't seem to be aware of the diffraction slice theorem which says that if you are missing low frequencies then the long offset data can recover the long wavelength components of model..and there is a quantitative formula that predicts how offset range

is related to recoverable wavenumbers. If you dont have both low frequencies and long offset then the envelope transform will do nothing to solve this problem.

Authors have this magical thinking that the envelope transform creates DC and low frequencies in data, and so this automatically means that they can recover low wavenumber components of model. They are dead wrong, as my simple example demonstrates.

I recommend rejection, they need to learn the fundamentals about what components of the data allow recovery of low wavenumber components of the model, and significantly modify their claims and analysis. Shin had it wrong, and so do they.

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