title: Time-Distance Analysis of Deep Solar Convection

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Recently it was shown by Hanasoge, Duvall, and DeRosa (2010) that the upper limit to convective flows for spherical harmonic degrees l<? is considerably smaller than the flows predicted by the ASH simulations (Miesch et al. ref) at the depth r/R=0.95. The deep-focusing time-distance technique used to develop the upper limit was applied to linear acoustic simulations of a solar interior perturbed by convective flows in order to calibrate the technique. This technique has been applied to other depths in the convection zone and the results will be presented.

The deep-focusing technique has considerable sensitivity to the flow signals at the desired subsurface location. However, as shown by Birch (ref), there is remaining much sensitivity to near-surface signals. Modifications to the technique using multiple bounce signals have been examined in a search for a more refined sensitivity, or kernel function. Initial results are encouraging and results will be presented.