



**Figure 5.** Comparisons between synthetic and observed 3-component displacement records from the 1990 Cape Girardeau event at station CCM. We filtered the records between 50 and 5 seconds period and invert for S-wave velocity using waveform inversion. We converged to the best solution within 3 iterations. The comparison shows considerable improvement up to 5 seconds period especially for the Sn, Sg, SmS, and Rayleigh wave phases relative to the initial model.