



Figure S1. Real data example for the Spanish station CART. a) Move out corrected radial RFs sorted by their back azimuths. White lines indicate P410s and P660s theoretical relative travel times. Note that P410s and P660s are consistently seen in contiguous tracks for certain back azimuths. b) PWS of RFs shown in (a). Yellow crosses mark the expected P410s and P660s conversions using model AK135. Normalized amplitudes larger than 0.5 and smaller than -0.5 are contoured in black and red respectively. Note the clear detection of the P410s and P660s phases.