

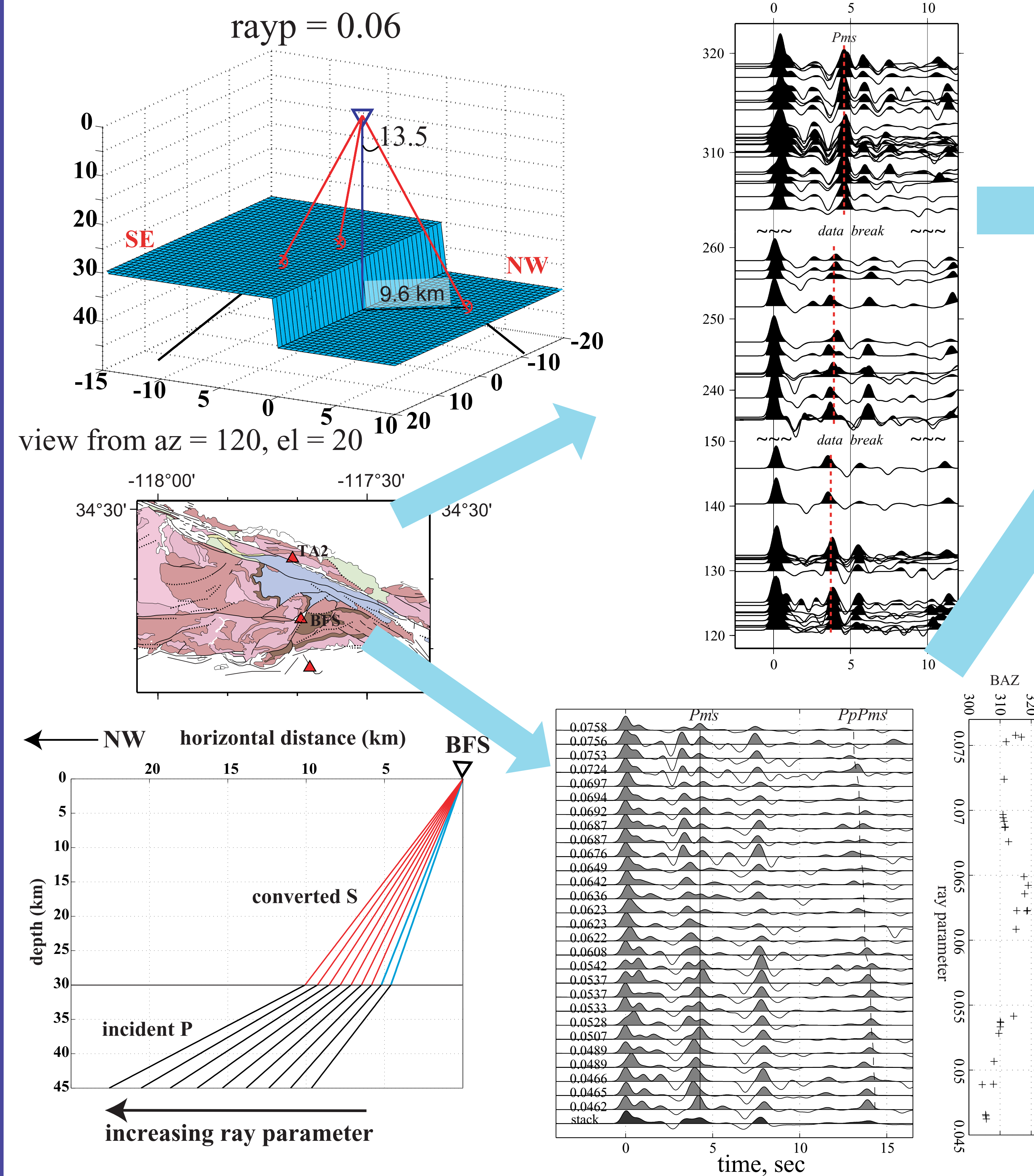
# Evidence for large Moho offset in Southern California from Receiver Functions

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## Abstract

Large offsets on the Moho are imaged among the back-azimuthal grouped Receiver Function (RF) beneath several stations in Southern California. Some of them correlate very well with the surficial geologically mapped faults, such as station TA2 on the San Andreas Fault (SAF), some of them occur in places where no surficial major faults exist, such as station DAN in Fenner Valley, Mojave Desert. Combined with synthetic RF waveform modeling, a notch structure is inferred on the eastern San Gabriel Mountains, where Moho shallows from 38 km north of the SAF, 34 km south of the San Gabriel Fault to ~29 km in between beneath the Mt. Baldy block.

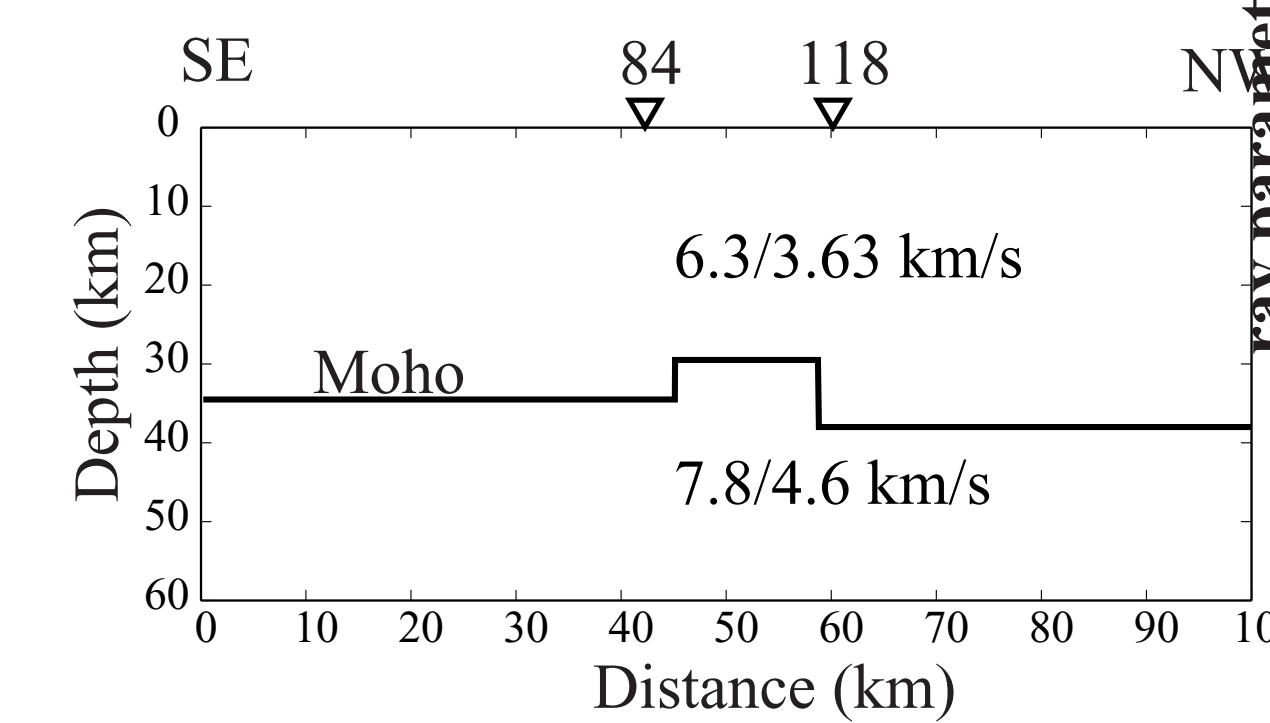
## More evidence in the San Gabriel Mountains



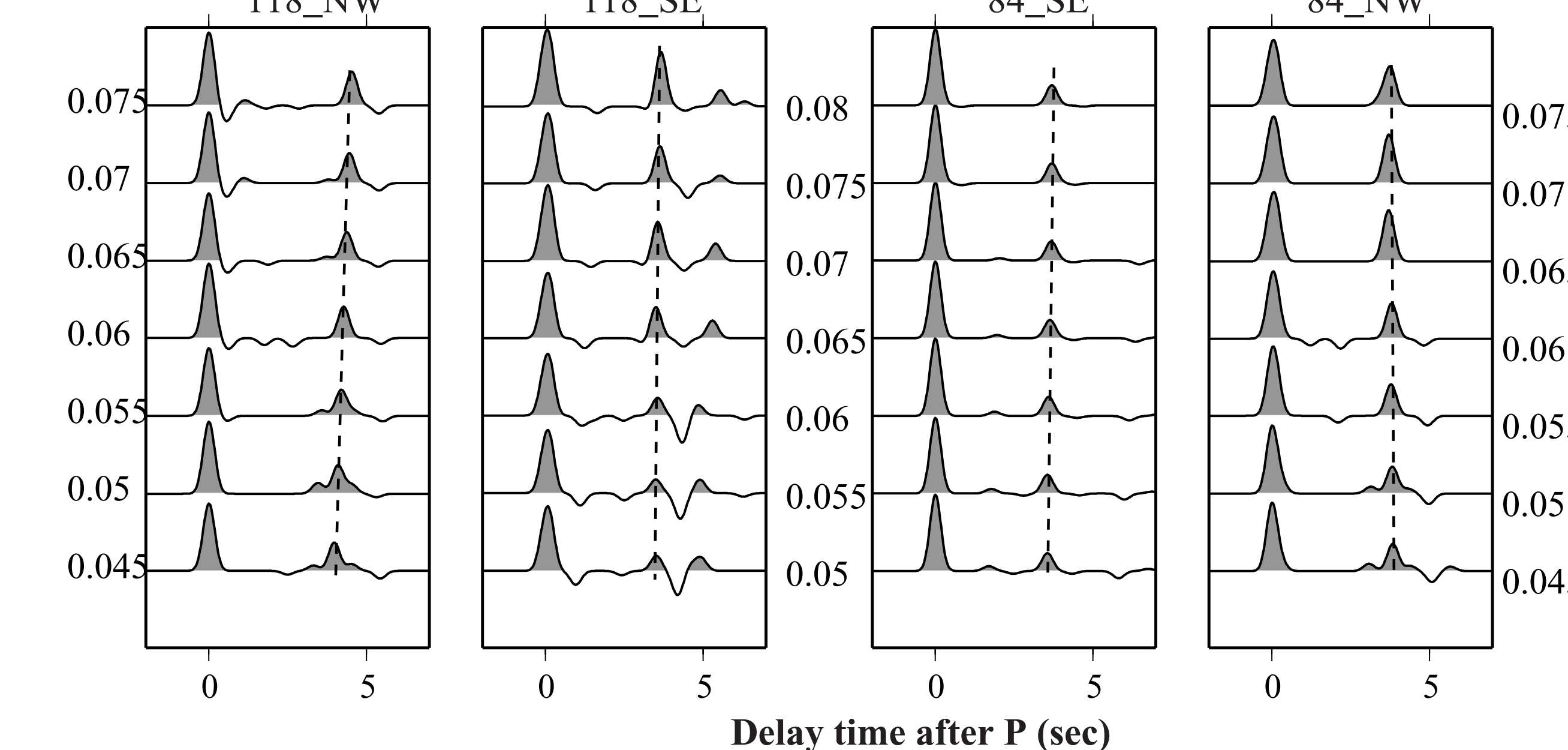
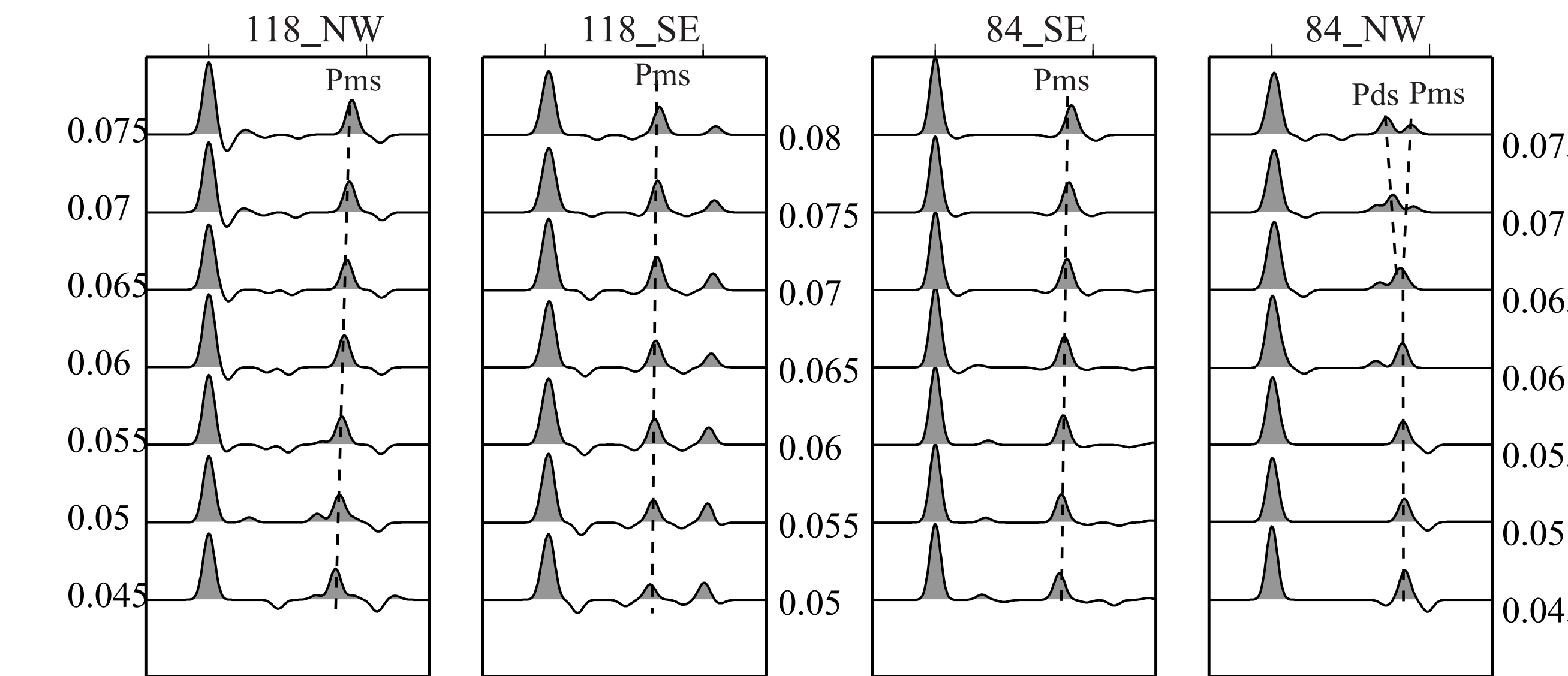
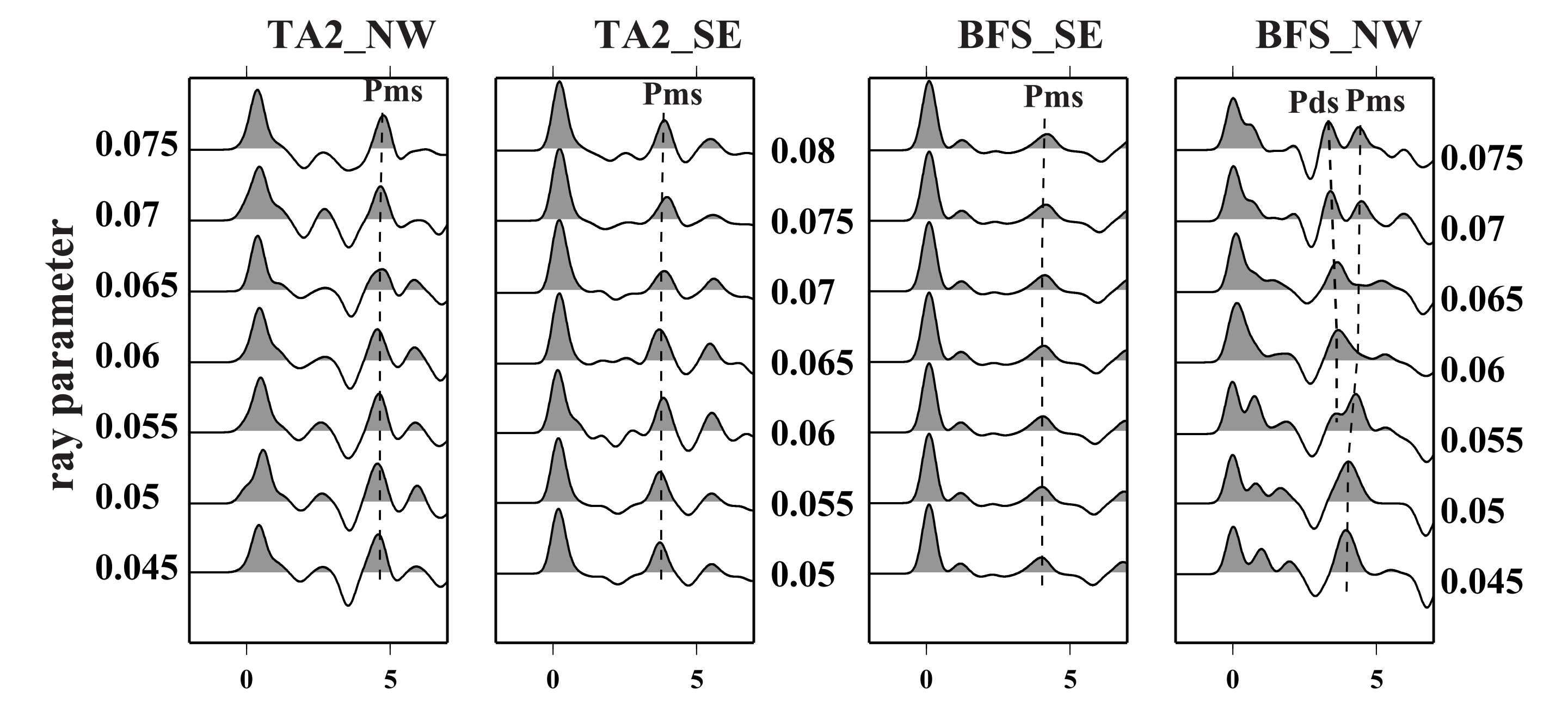
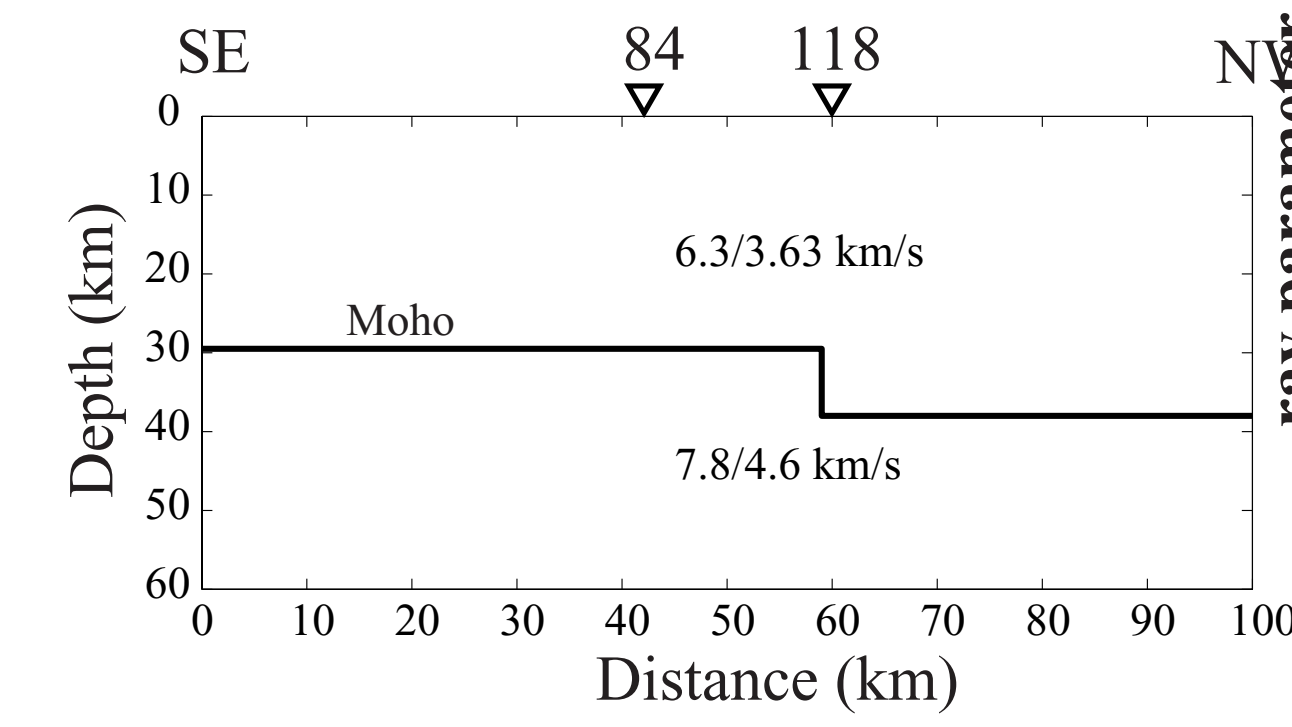
## Data Summary

## Synthetic Waveform modeling

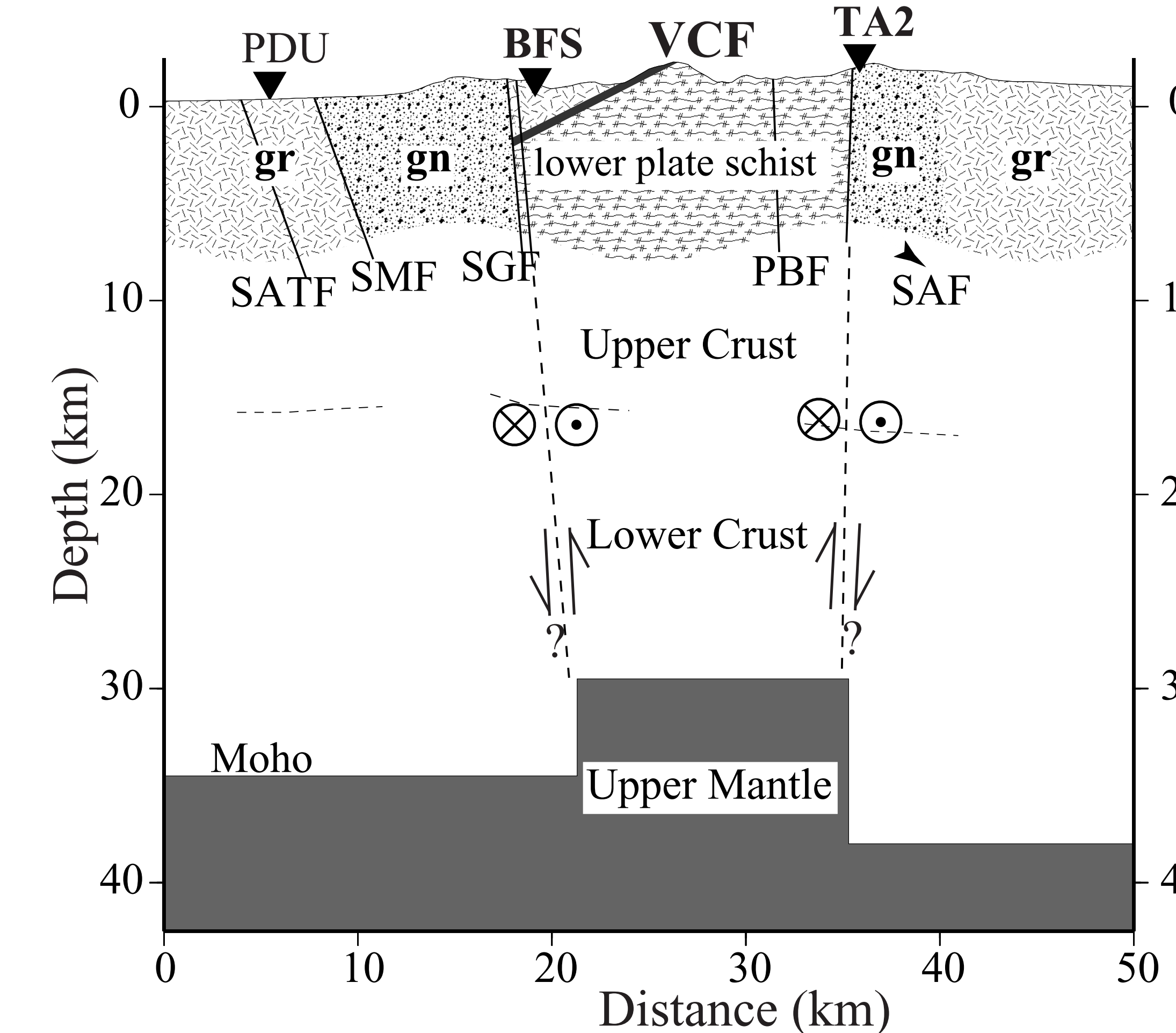
### Notch on the Moho



### Step on the Moho

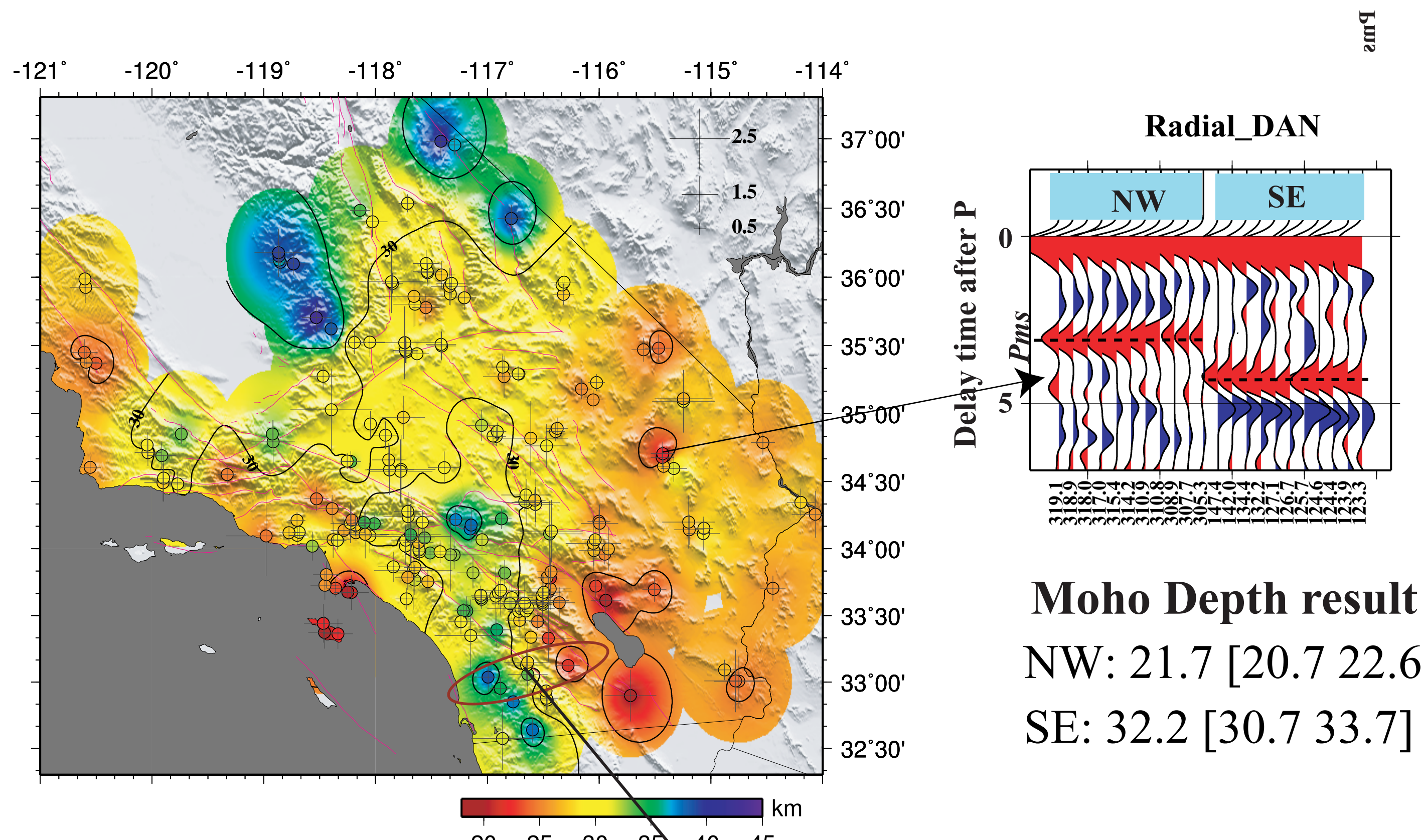


## Summary



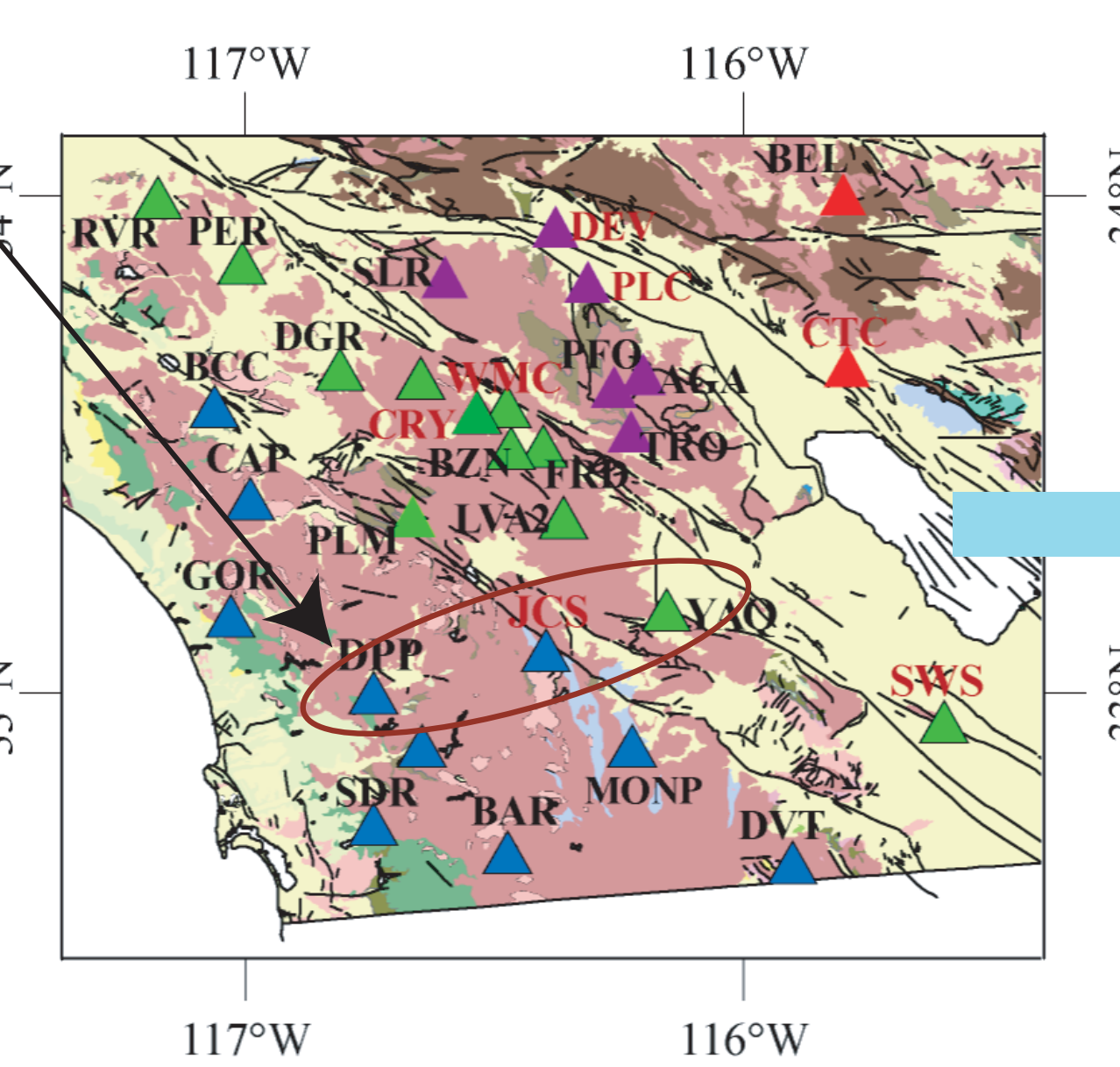
Synthetic waveform modeling for the anomalous features in the receiver functions for two stations (TA2 and BFS) in the eastern San Gabriel Mountains indicates that a notch structure exists on the Moho, where the Moho shallows from 38 km north of the SAF, 34 km south of SGF to ~29 km beneath the Mt. Baldy block. The shallow Moho correlates very well with the surficial exposure of the lower plate Pelona Schist or places where the schist resides at very shallow depth. This is either related to the strike-slip movements along the two major faults or caused by differential uplifting.

## Examples of large offset on the Moho



Moho Depth result  
NW: 21.7 [20.7 22.6]  
SE: 32.2 [30.7 33.7]

At station DAN in the Mojave Desert, a large Moho offset of ~10 is inferred. At station JCS, which locates on the Elsinore Fault, large Pms of 4.5 sec is observed for the RFs from West, while small Pms arrival of 3 sec is observed for events from SE. The large Moho offset here is confirmed by the two nearby stations DPP and YAQ.



## RFs

