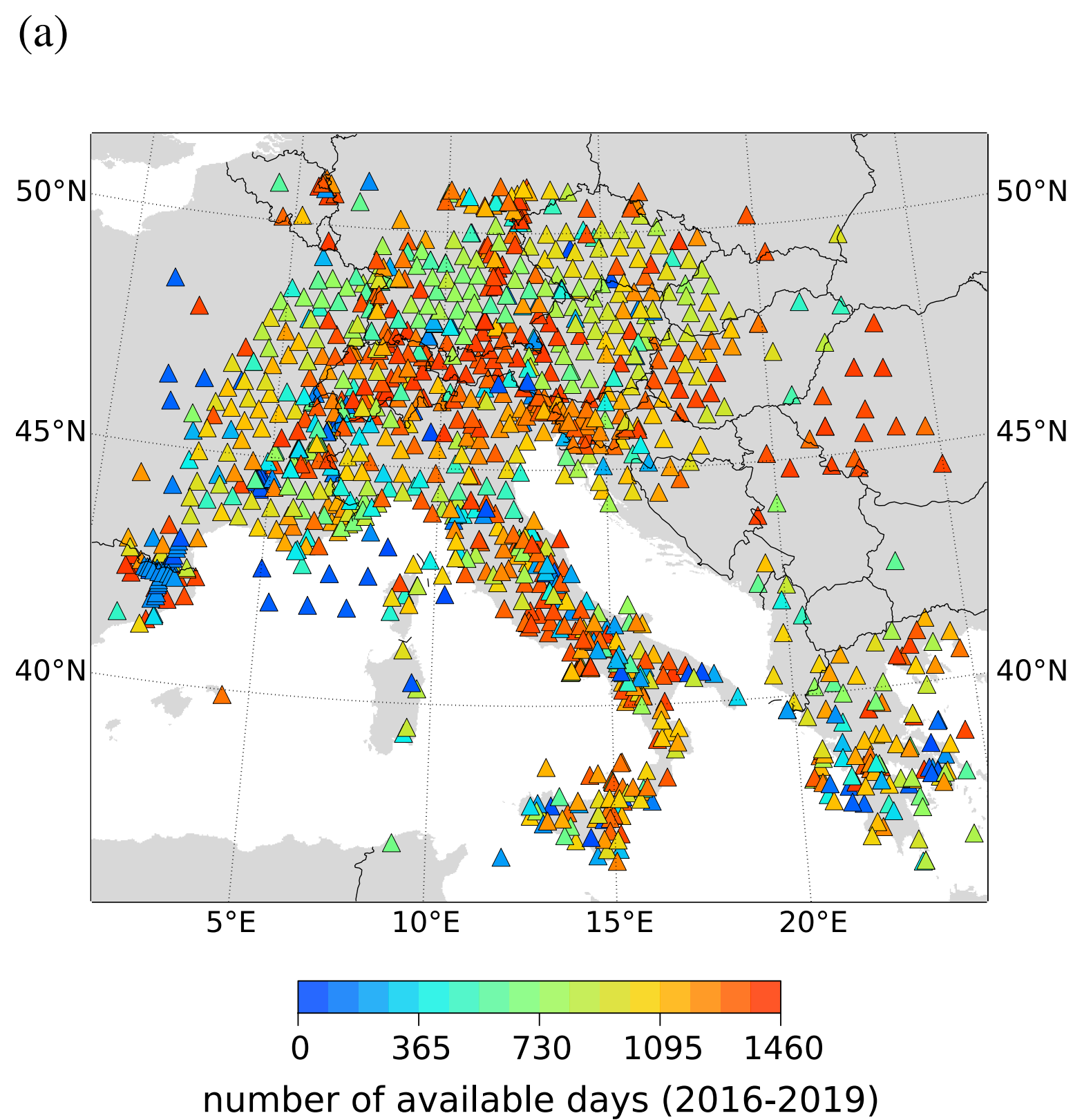


Mapping the 410-km and 660-km discontinuities across the European Alps using noise correlations

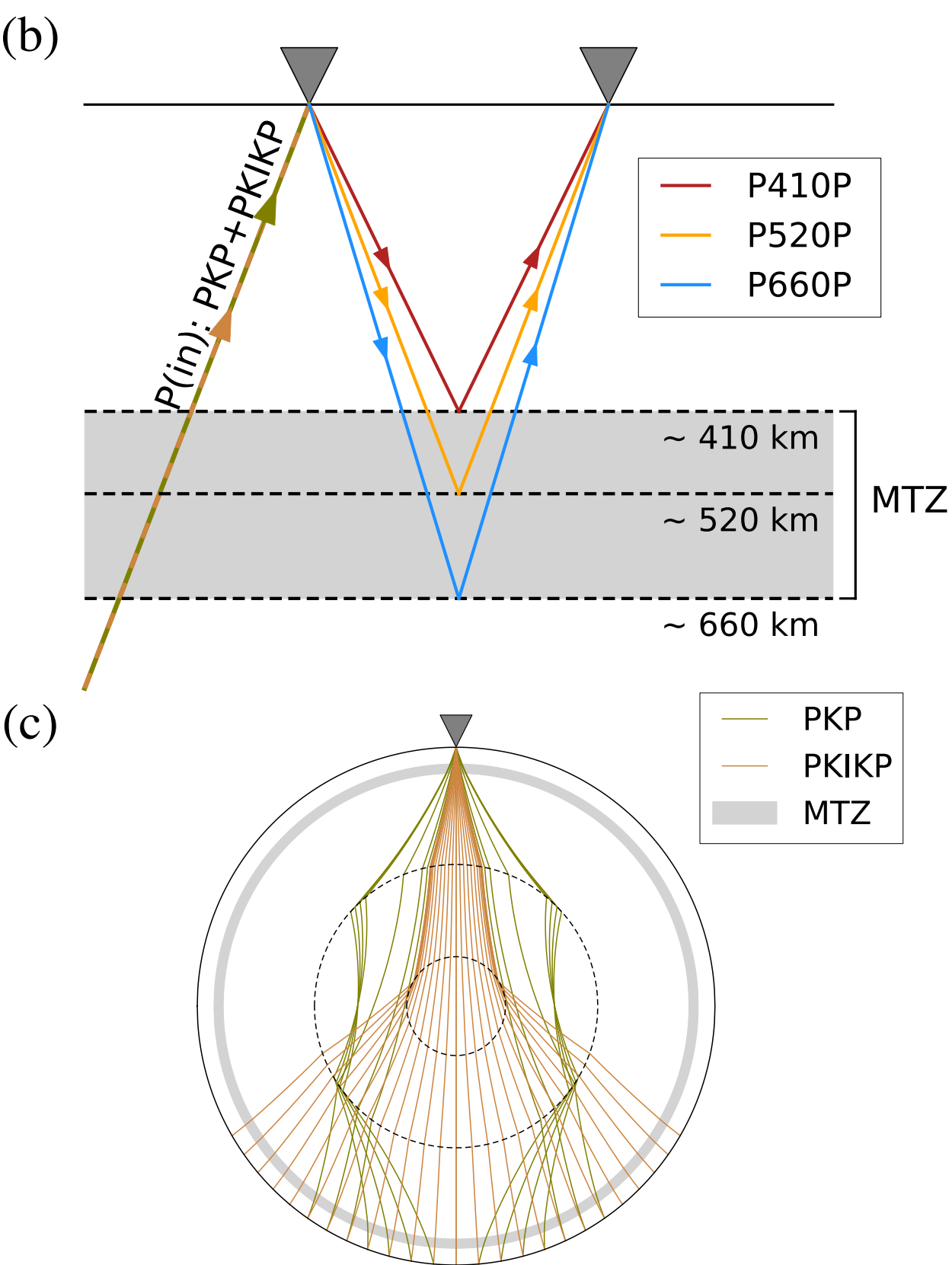
Yang Lu¹, Götz Bokelmann¹, and AlpArray Working Group

1. Department of Meteorology and Geophysics, University of Vienna

Contact: yang.lu@univie.ac.at



Data: continuous recordings (Z-component, 2016-2019) from ~1200 BB seismic stations



Method: MTZ reflection phases (P410P, P520P, P660P)

Seasonal variations of noise sources:

1. North Atlantic Ocean

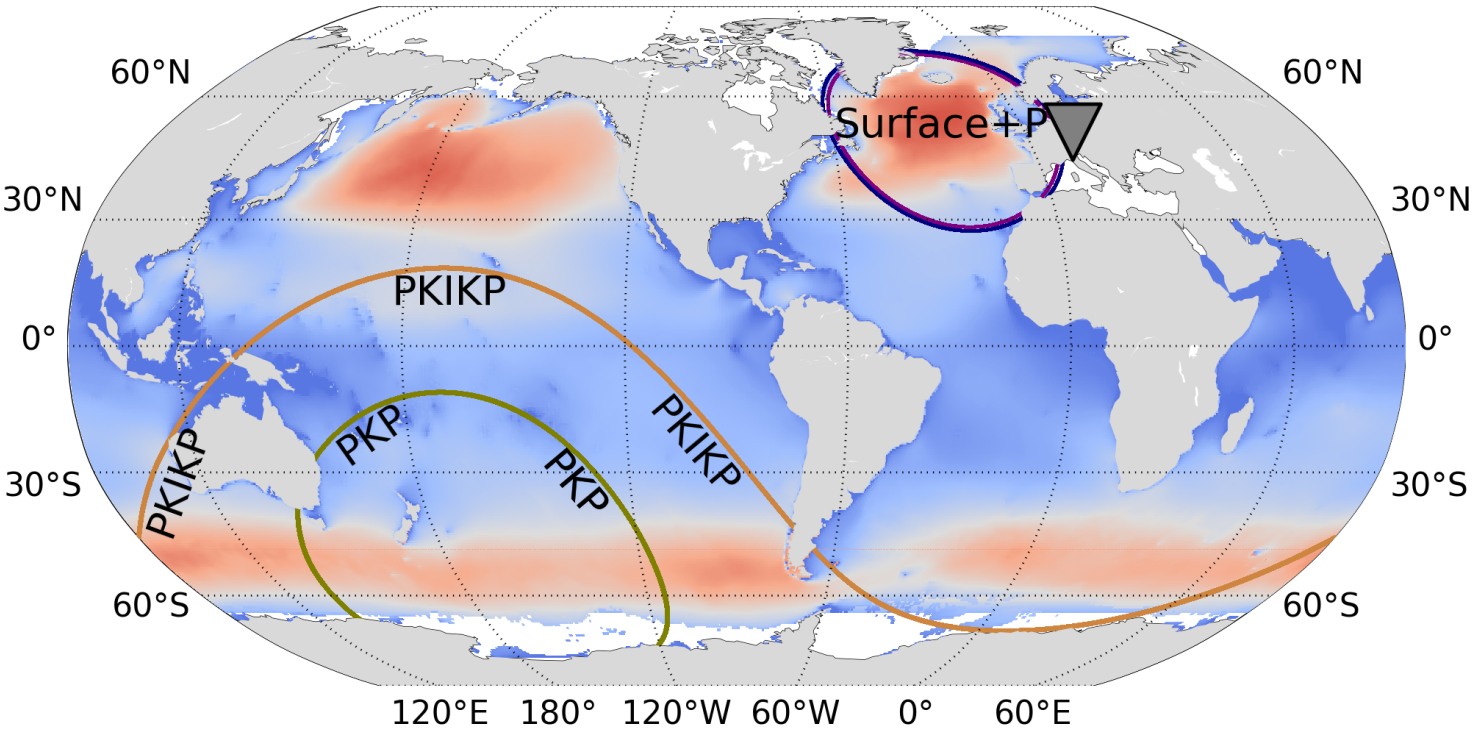
winter: active
summer: silent

2. South Pacific Ocean

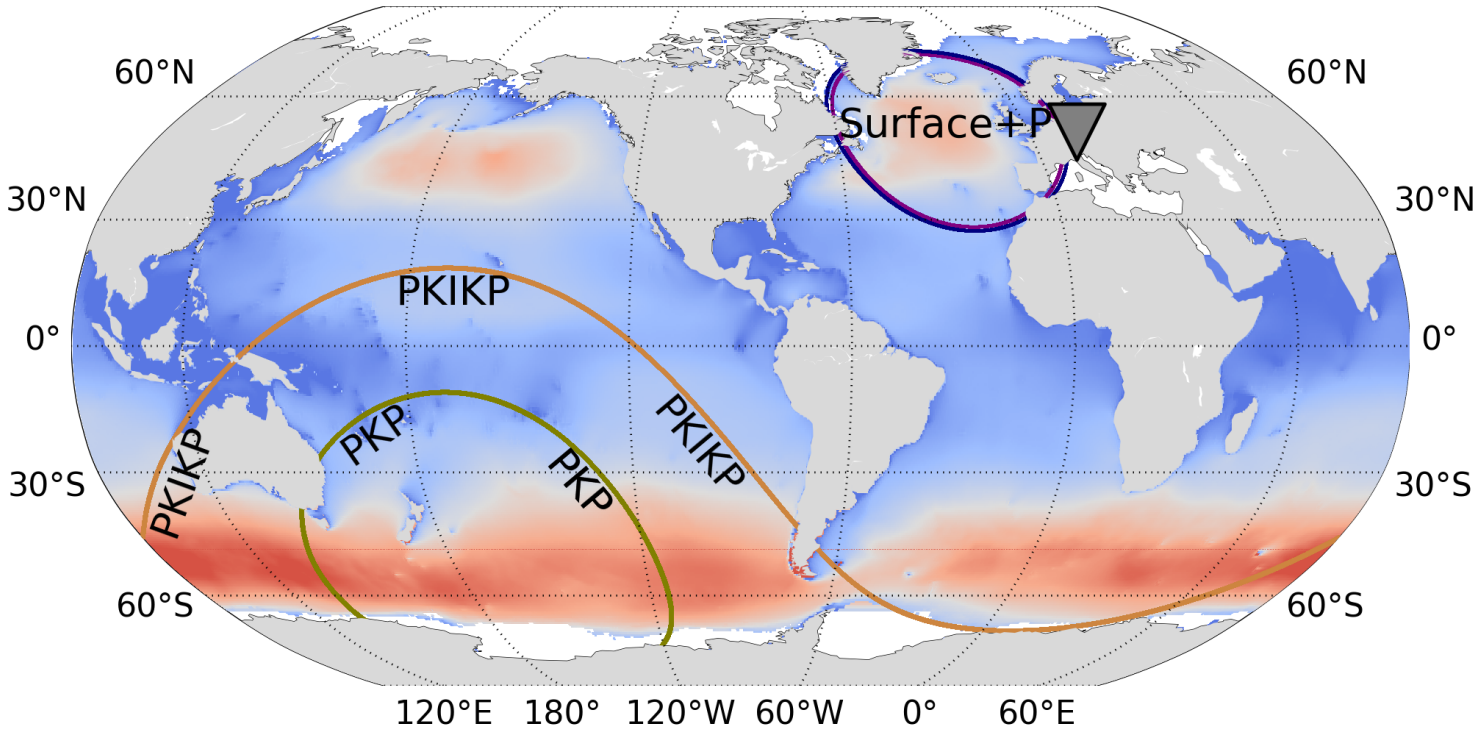
winter: moderate
summer: active

More details on noise wavefield properties:
Yang Lu, Helle A. Pedersen, Laurent Stehly, and AlpArray working group, 2022. Mapping the seismic noise field in Europe, Spatio-temporal variations in wavefield composition and noise source contribution, GJI

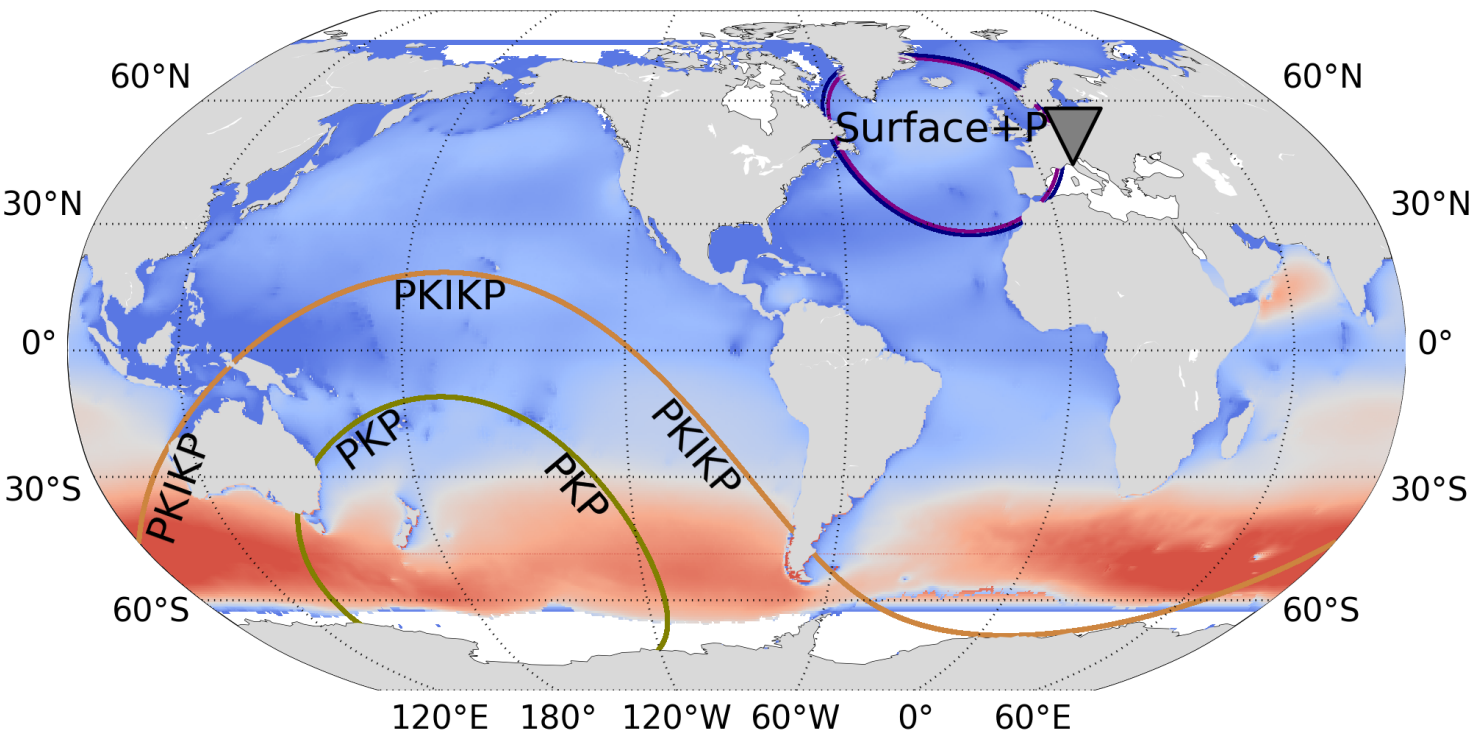
(a) Winter (Dec., Jan., Feb.)



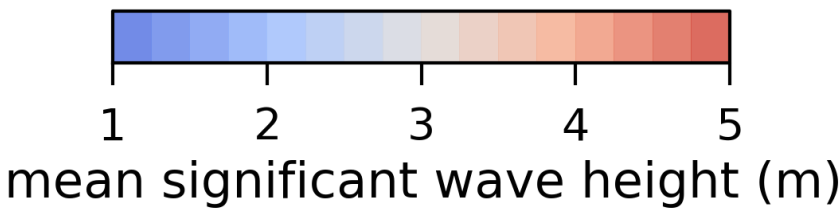
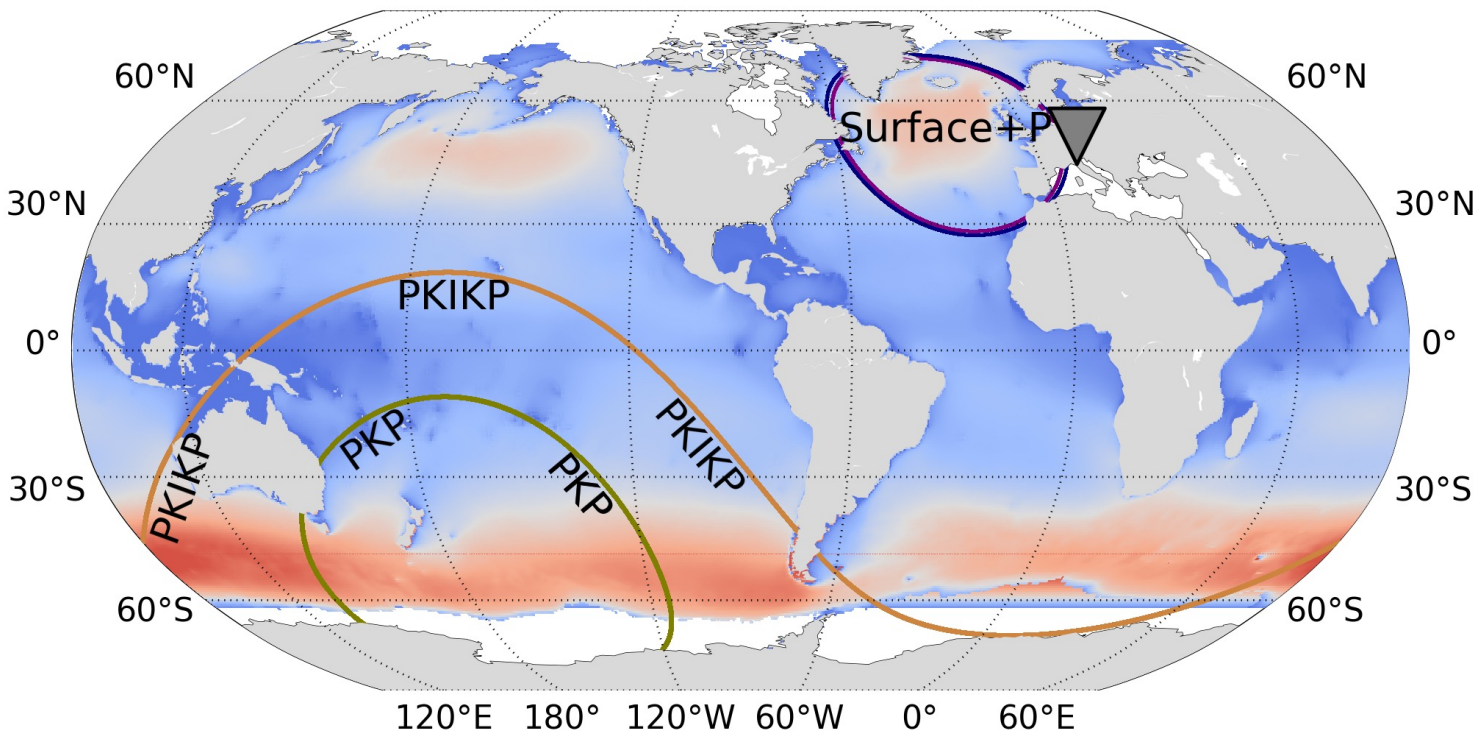
(b) Spring (Mar., Apr., May.)



(c) Summer (Jun., Jul., Aug.)



(d) Autumn (Sep., Oct., Nov.)



Seasonal mean ocean wave height (WAVEWATCH III)

Seasonal variations of CCFs

1. North Atlantic Ocean

winter: active
summer: silent

2. South Pacific Ocean

winter: moderate
summer: active

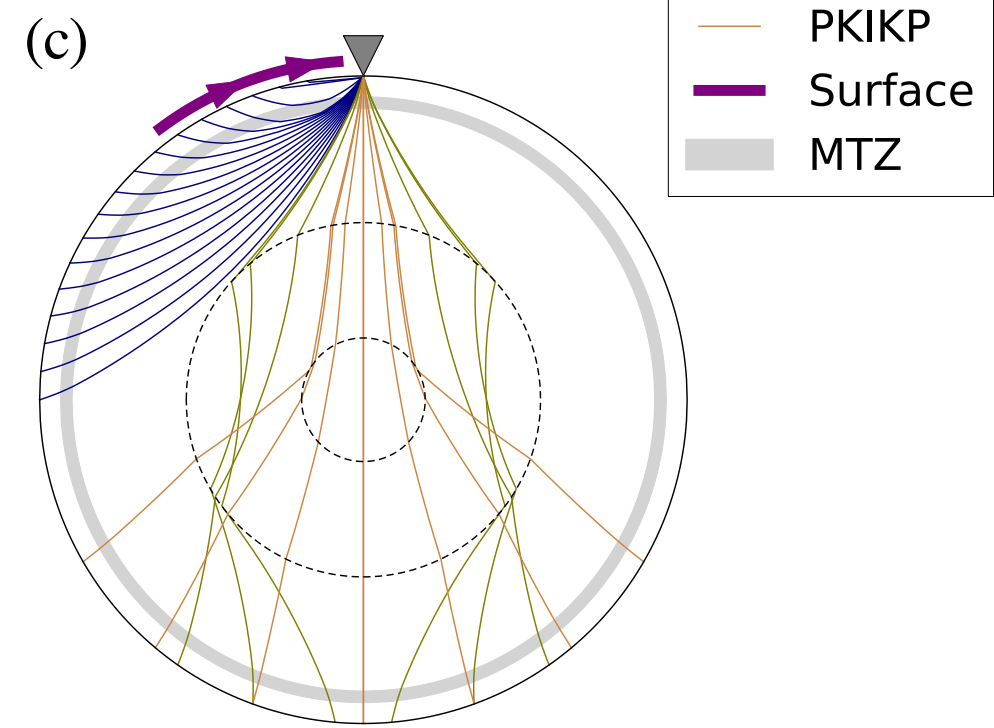
winter: favors surface waves

summer: favors near-vertical incident body waves (and deep reflection phases)

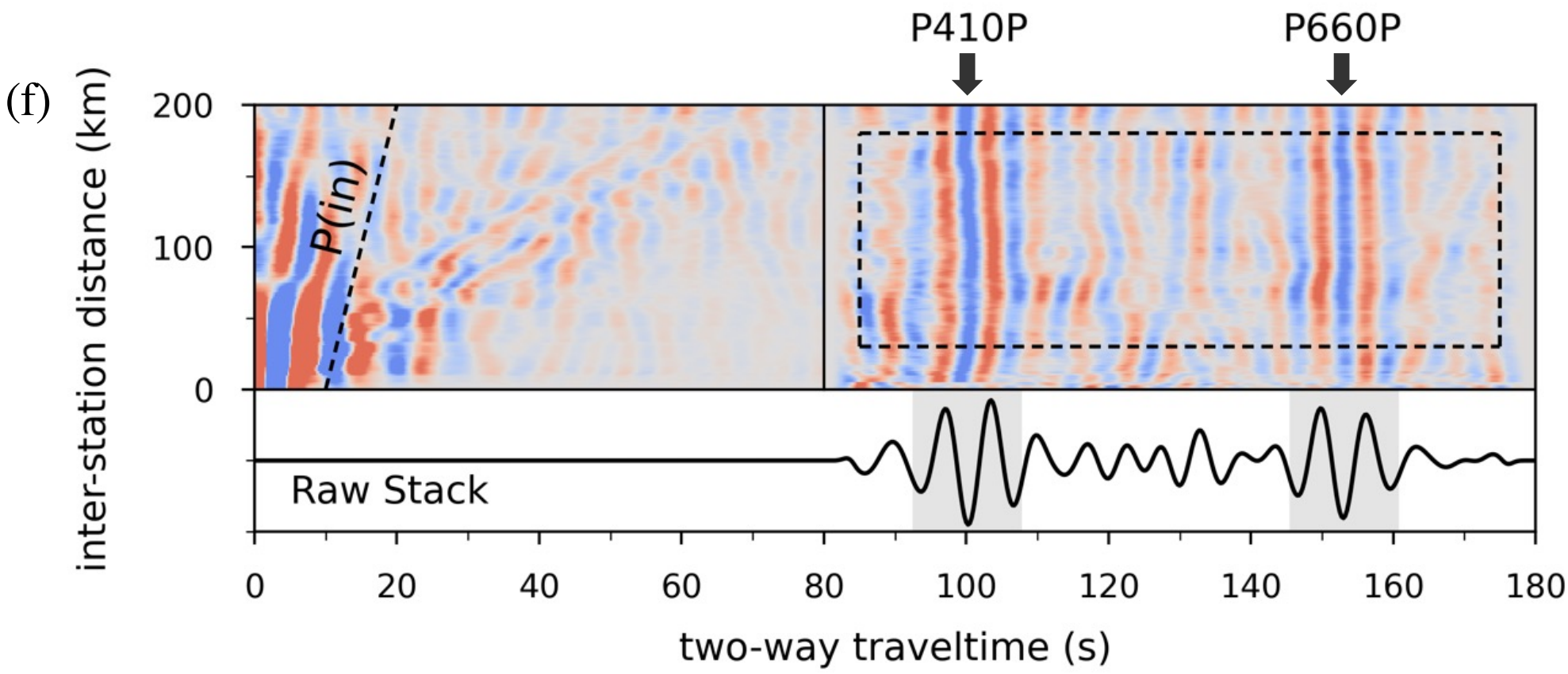
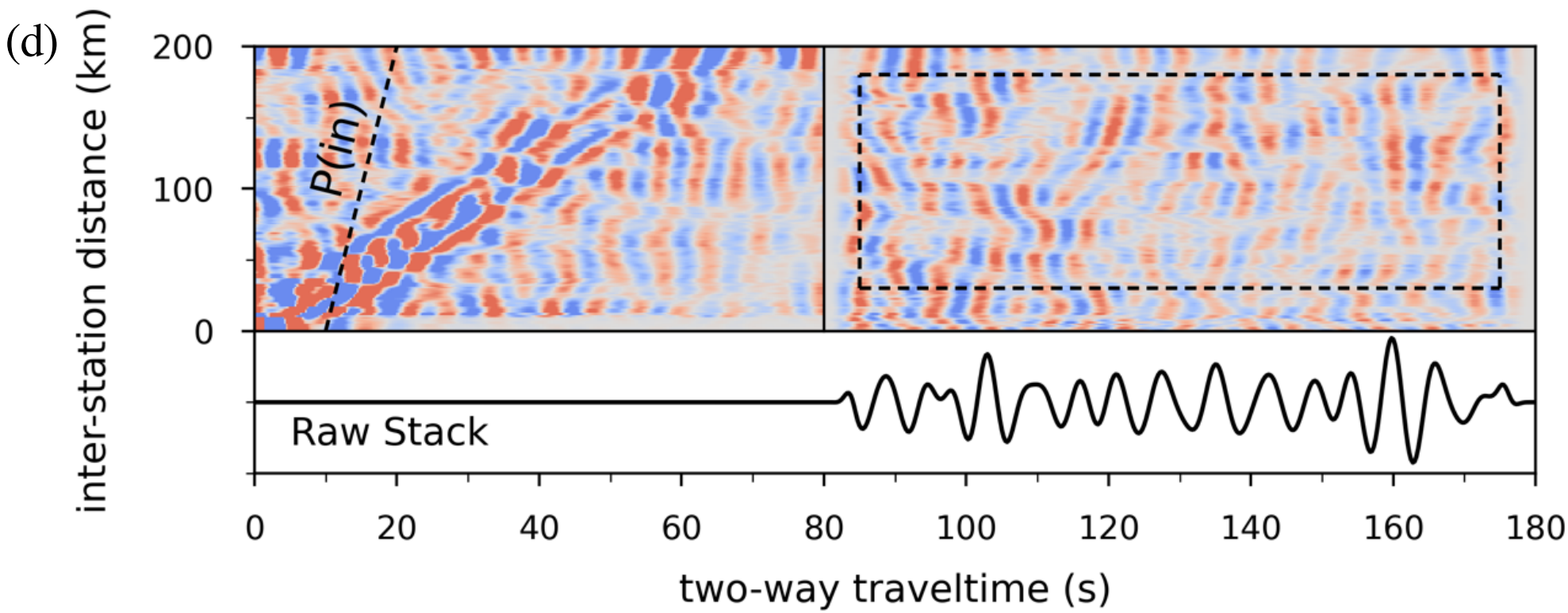
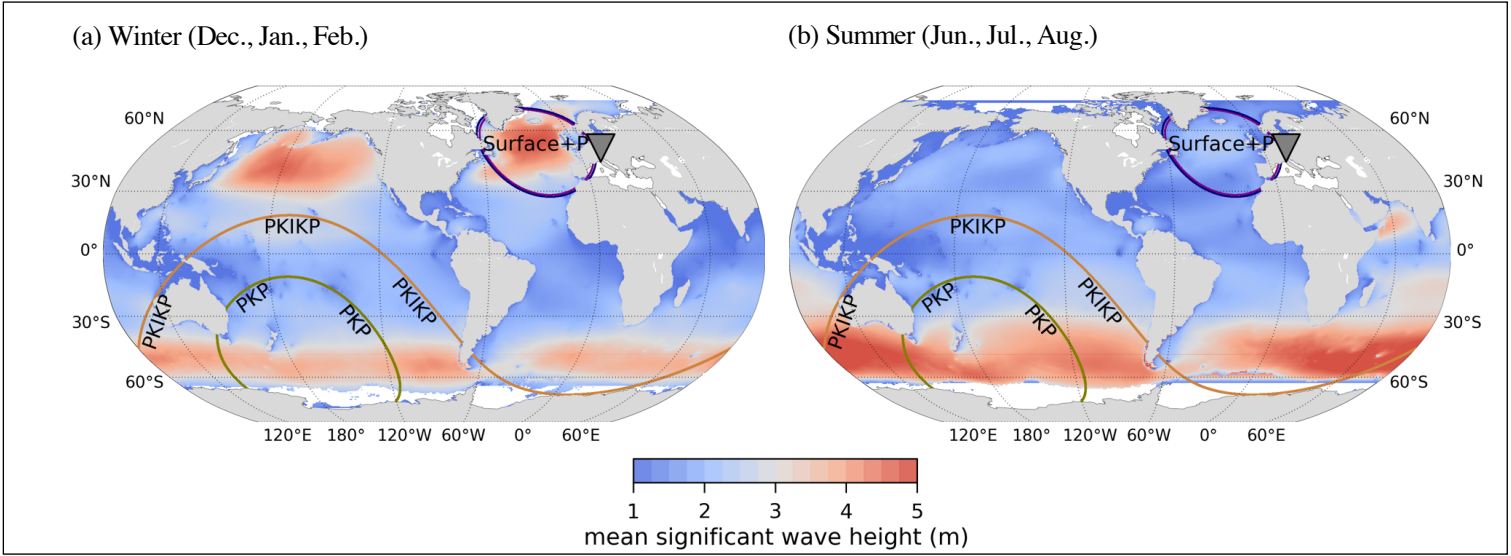
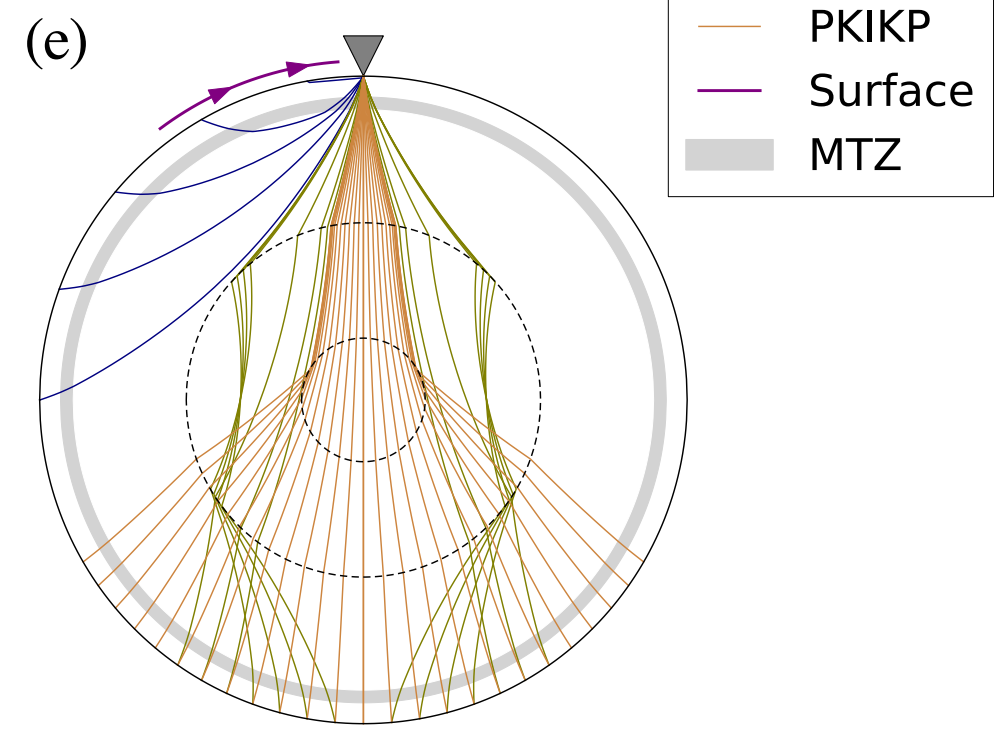
More details on noise wavefield properties:
Yang Lu, Helle A. Pedersen, Laurent Stehly, and AlpArray working group, 2022. Mapping the seismic noise field in Europe, Spatio-temporal variations in wavefield composition and noise source contribution, GJI

Period band: 4-10 s

Winter regime:



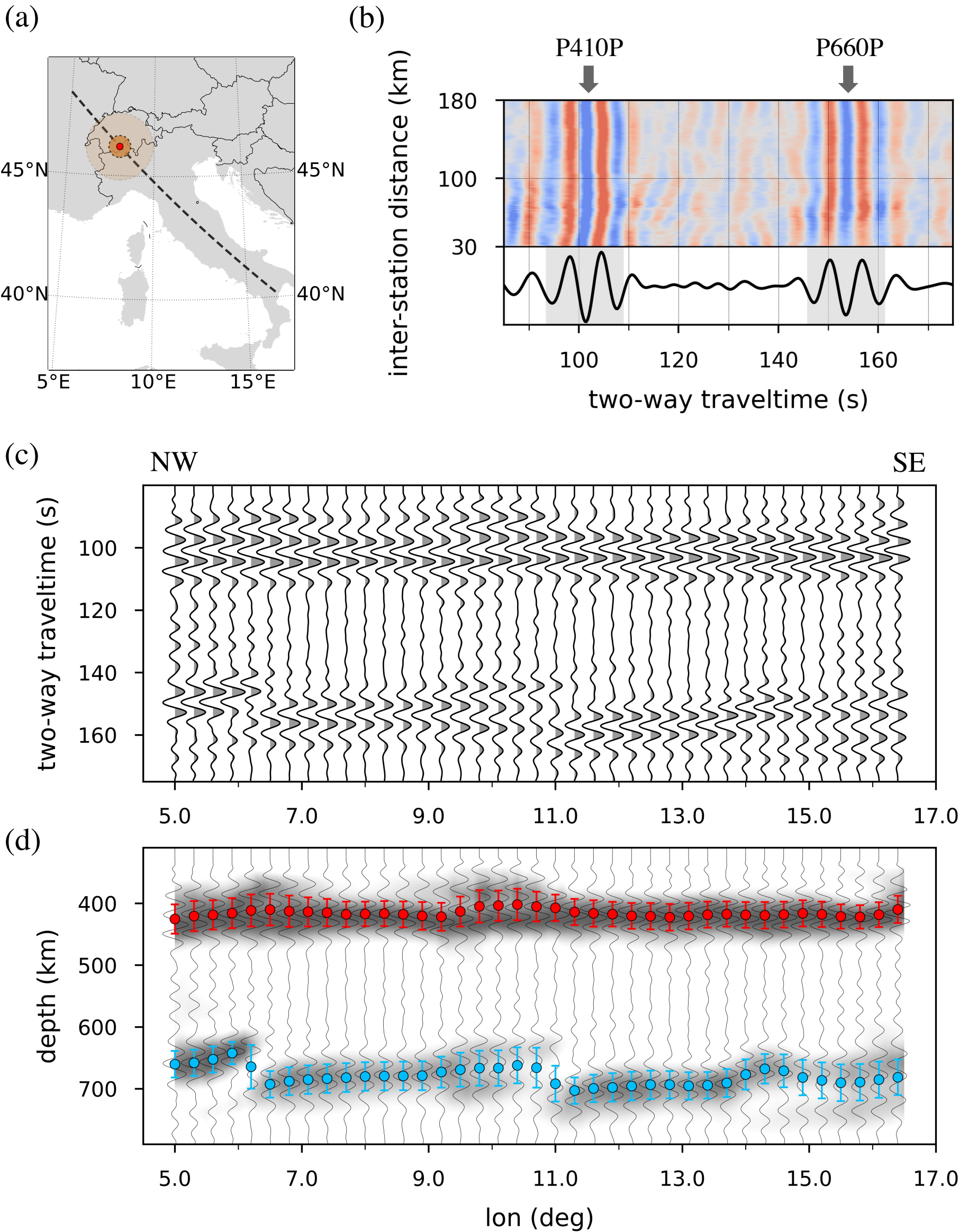
Summer regime:



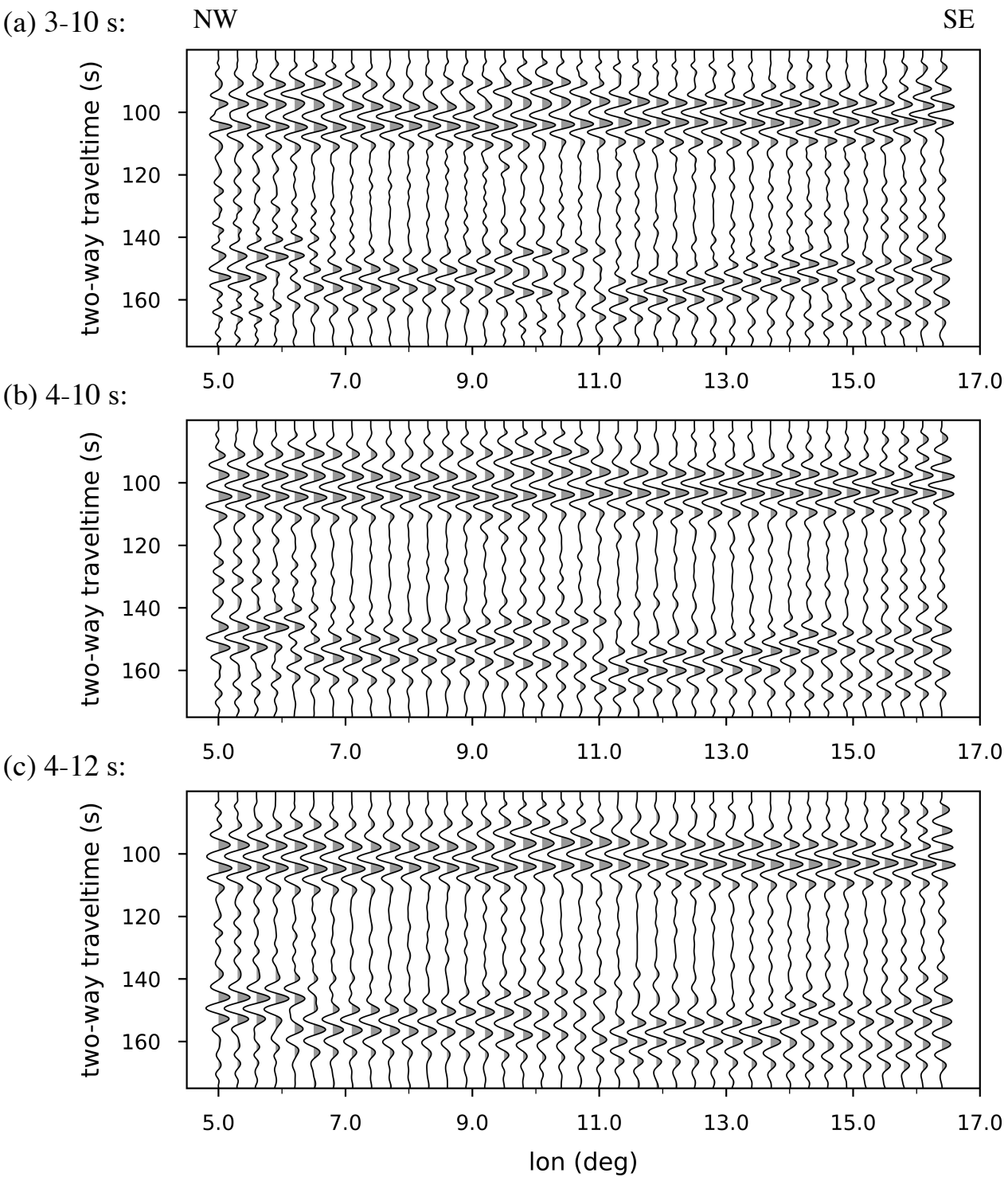
Regionalization and Stacking of CCFs

Common reflection region (radius of 50 km) stacking

- Retrieved reflection phases are:
- 1. consistent over different period bands (3-12 s)
 - 2. consistent over different velocity models used for NMO-correction



consistent over different period bands:



Results

- a) topography of the 410-km interface
- b) topography of the 660-km interface
- c) lateral variation of the MTZ thickness
- d) thickness/complexity of each interface

