Toward a three-dimensional tomographic model of the Pacific upper-mantle with full resolution and uncertainties

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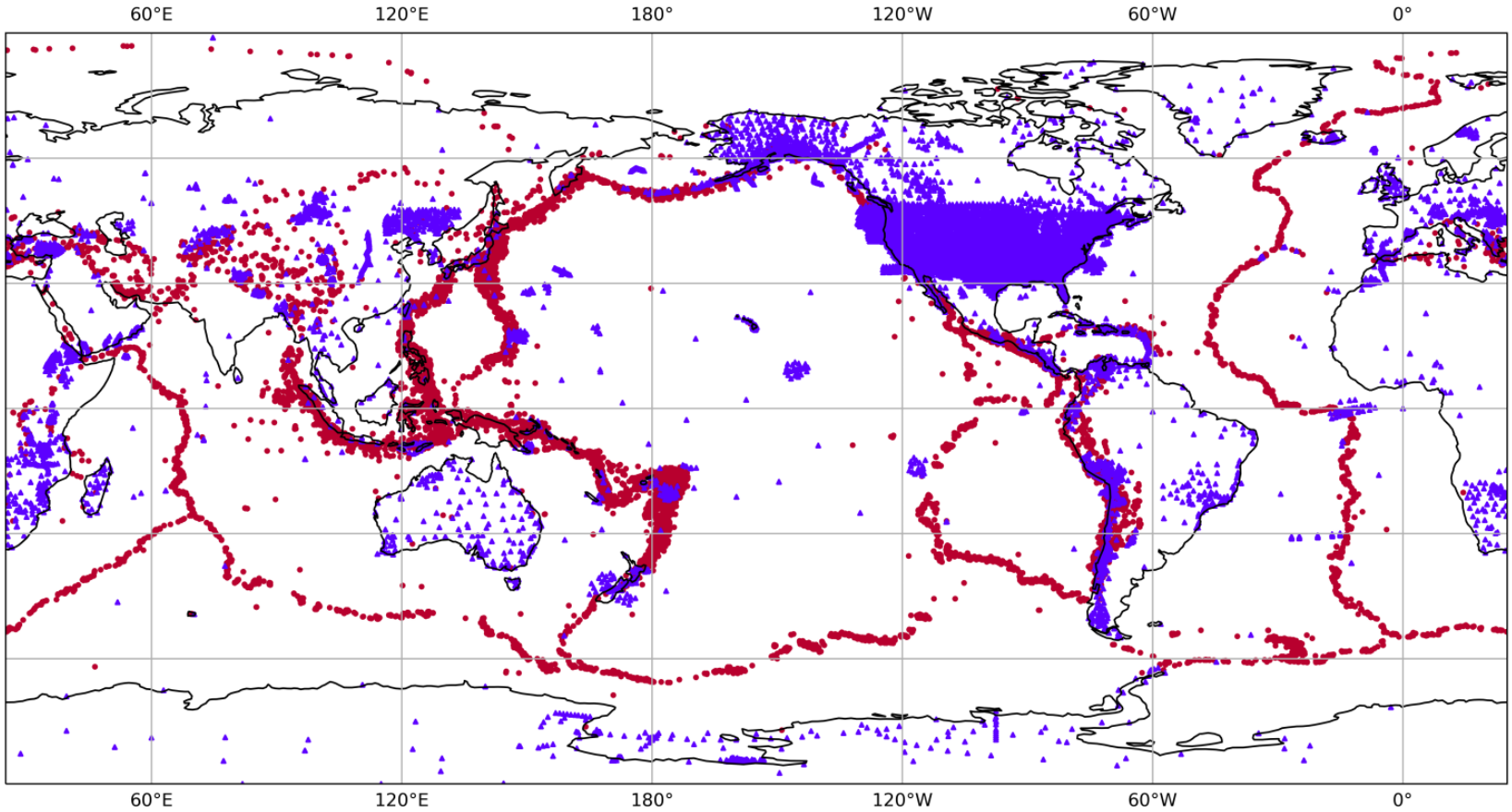
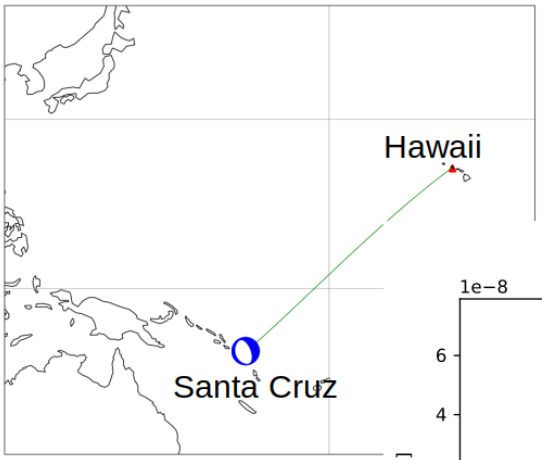
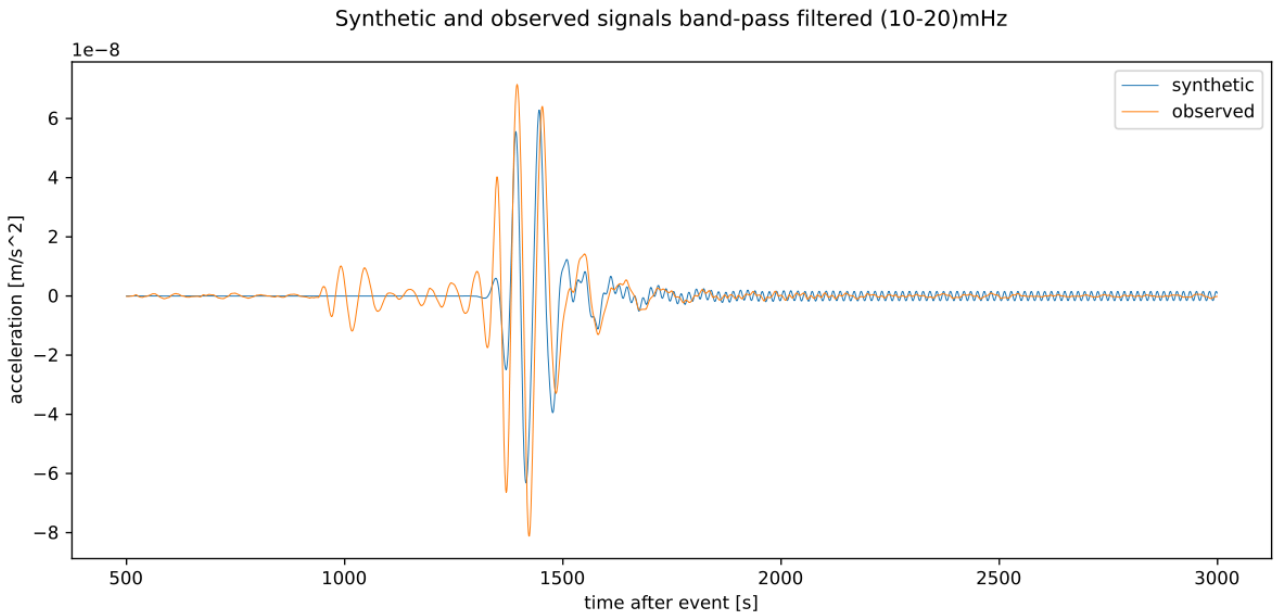
Uneven data distribution



Data from IRIS

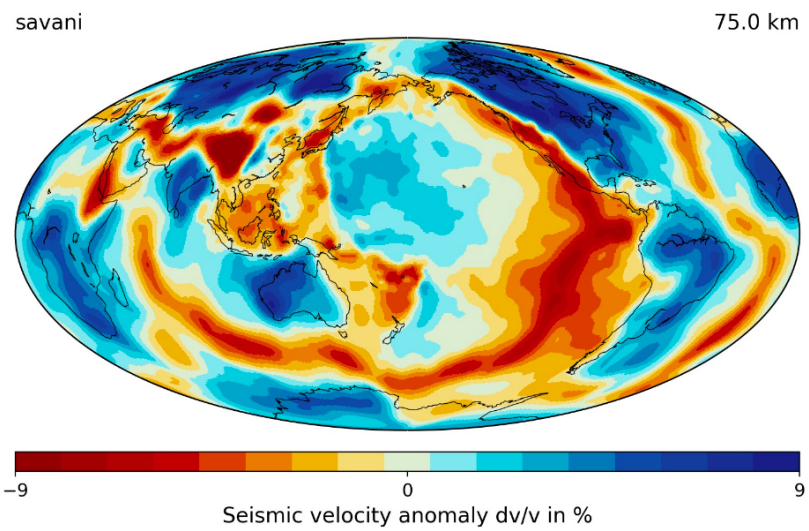
Noisy data



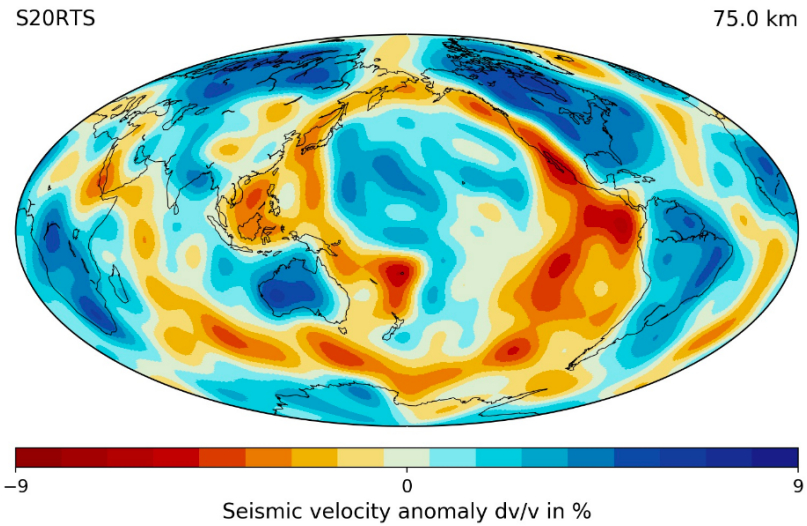


Data from IRIS; synthetic from MINEOS, Masters et al. (2014)

Discrepancies between models



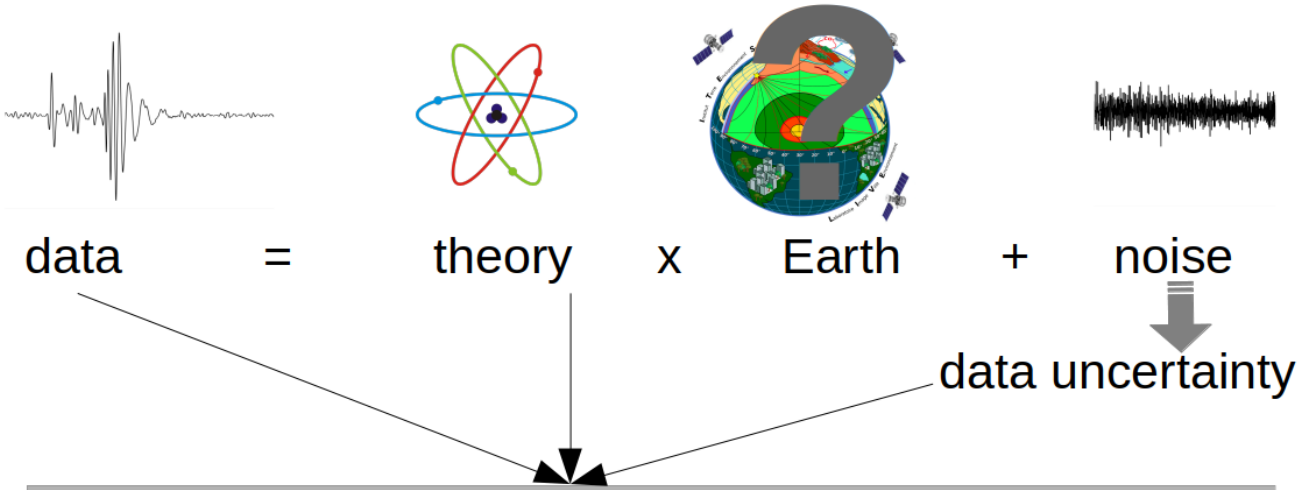
Auer et al. (2014)



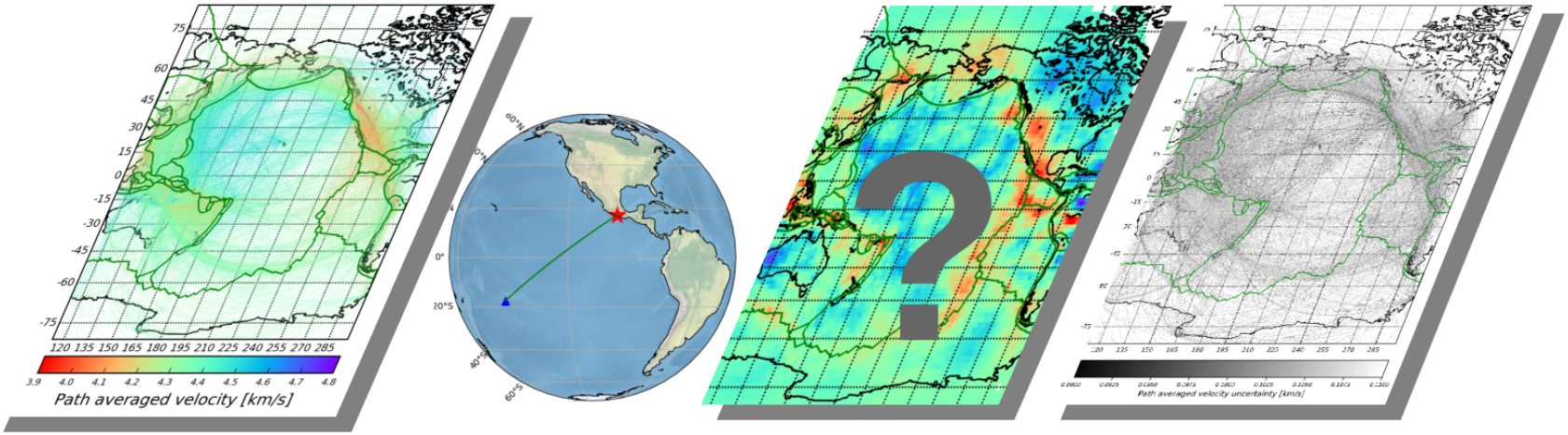
Ritsema et al. (2019)

Hosseini, K. et al. (2018): SubMachine

Resolution-uncertainty driven inversion



2D linear forward problem



path Vsv = ray theory x 2D Earth + noise

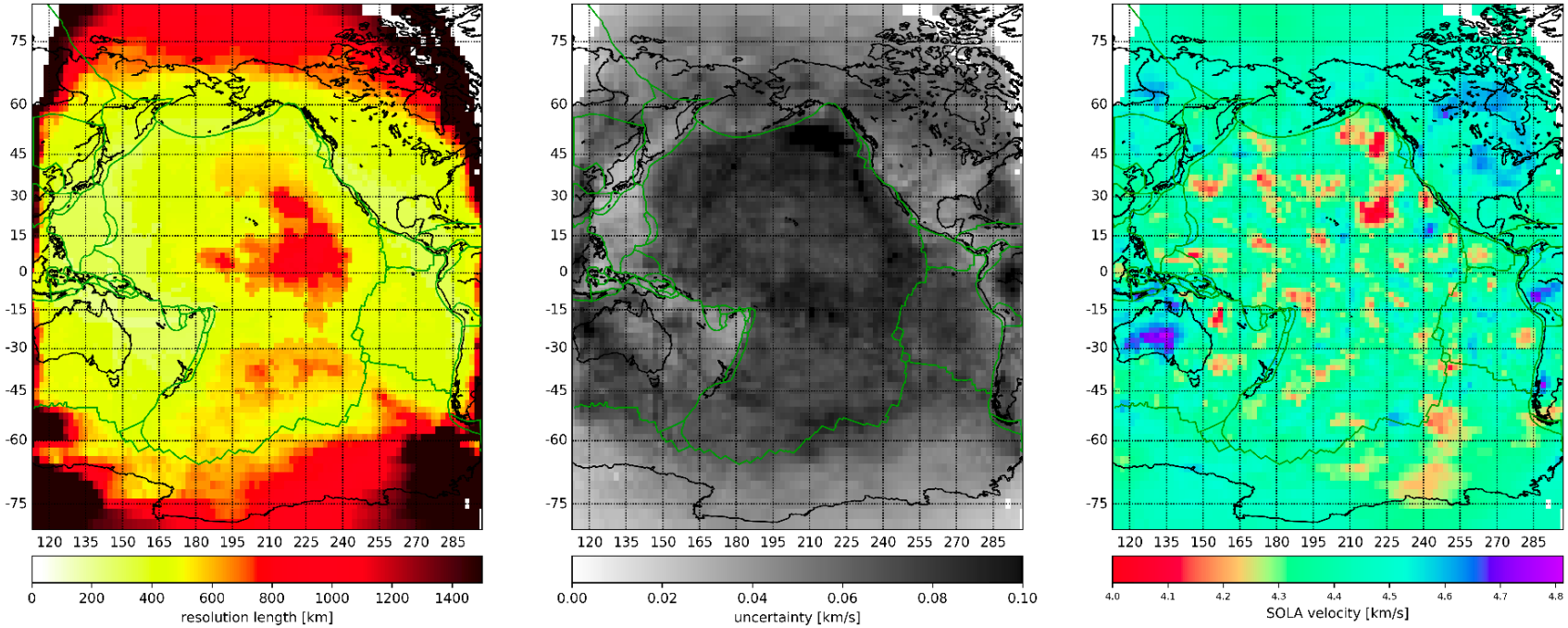
Multiple sampling

data uncertainty

Data from Maggi et al. (2006)

Results

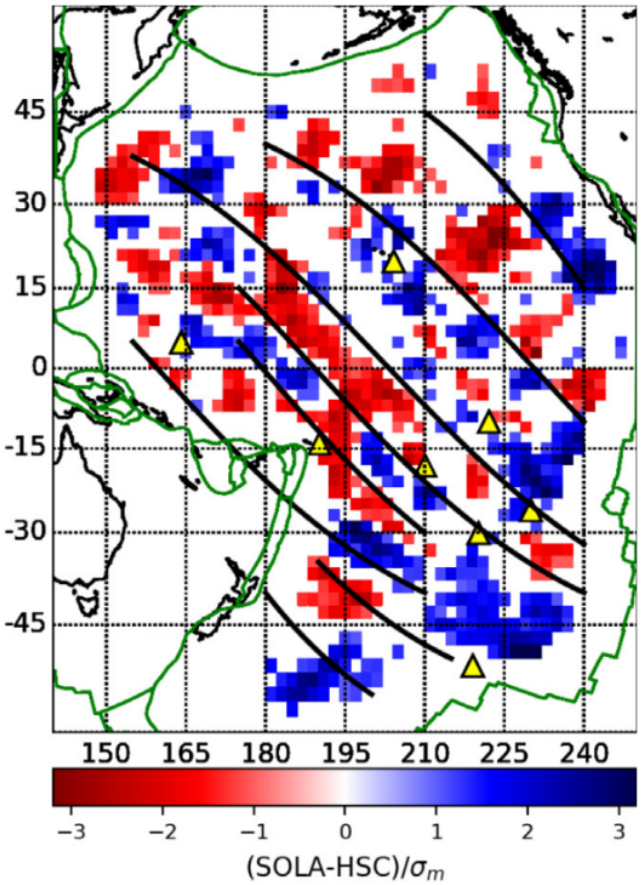
At 200km depth

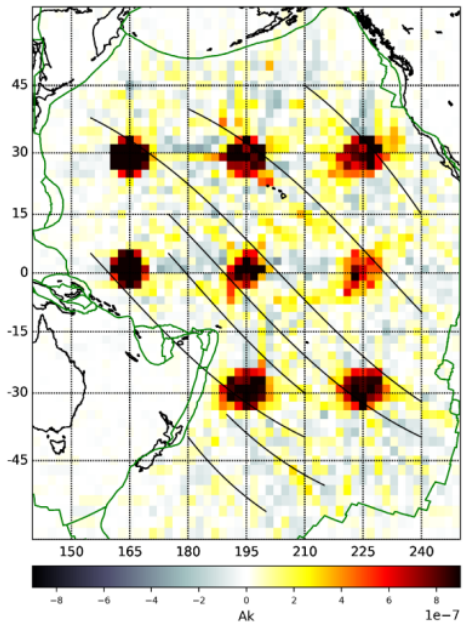


Latallerie et al. (2022)

Results

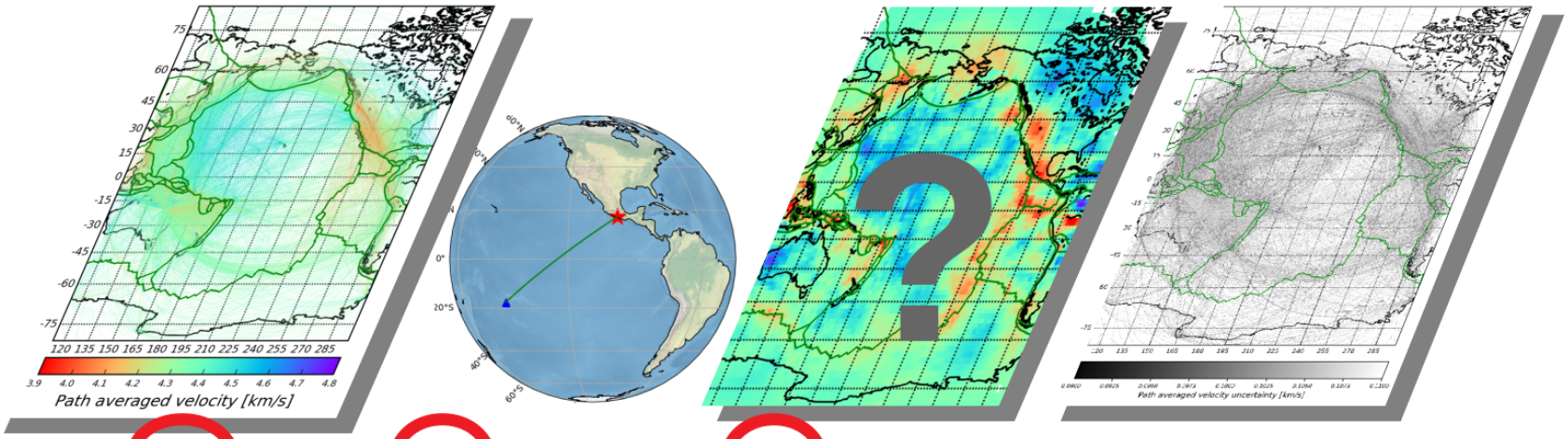
At 200km depth





Latallerie et al. (2022)

Limits



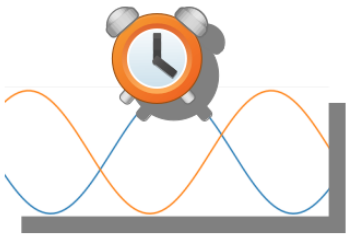
path Vsv = ray theory x 2D Earth + noise

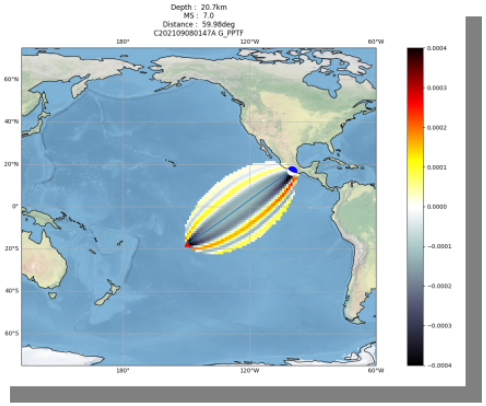
Multiple sampling

data uncertainty

3D linear forward theory

Zhou et al. (2004)





phase delay = Finite frequency theory x 3D Earth + noise

robust estimation

data uncertainty

$$\delta\phi = \iiint K(\underline{x})\delta\beta(\underline{x})d^3\underline{x} + n$$

Data and Method