



# Sensitivity optimisation of 12C seismic observations

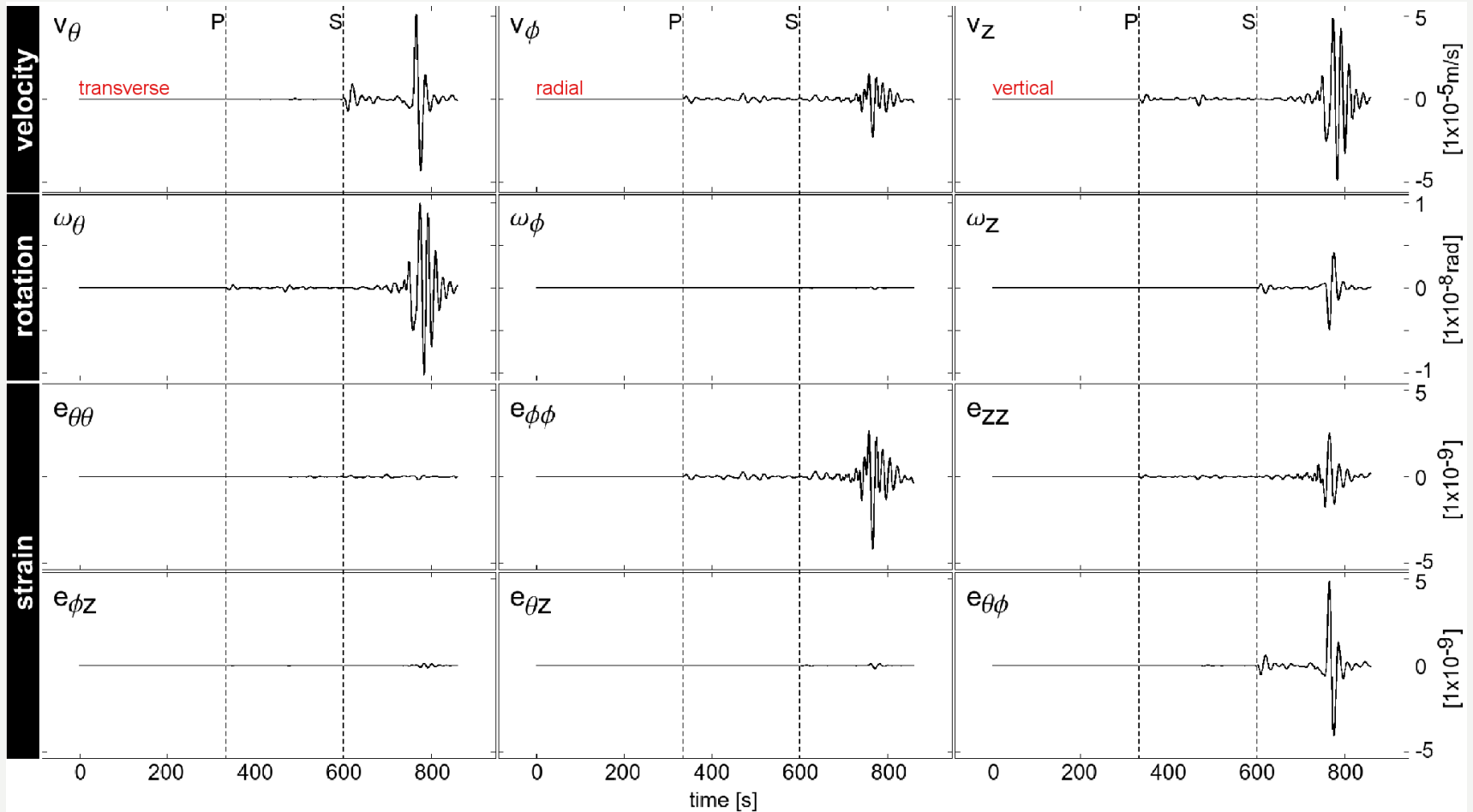
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12C seismic observations:

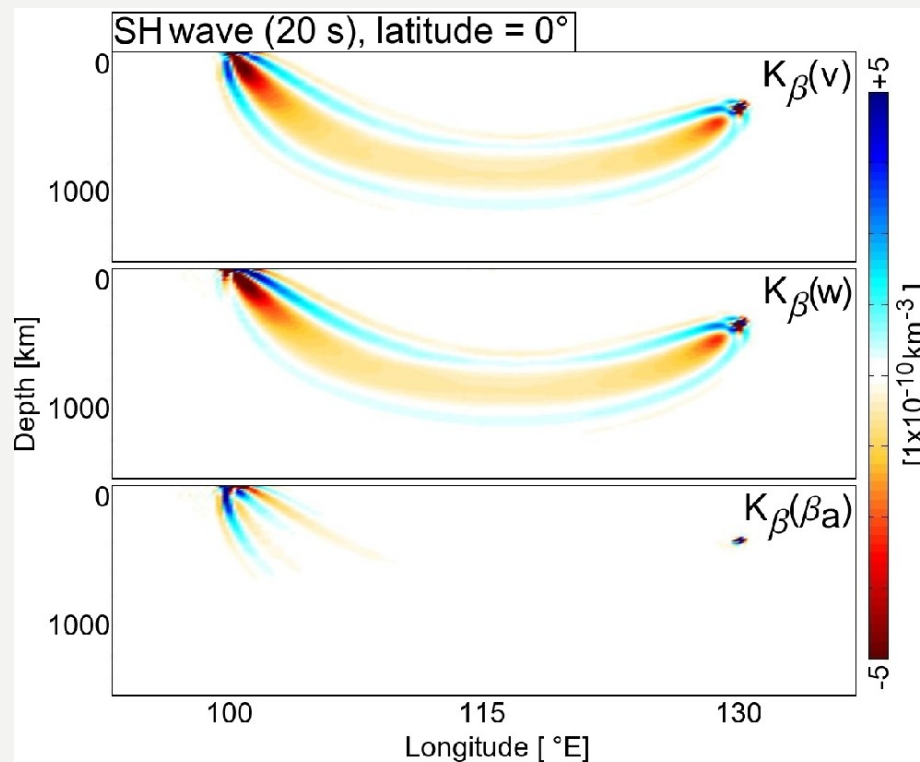




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## I. Physical intuition





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## II. Mathematical derivation

Sensitivity power:

$$\mathfrak{S}_j(\mathbf{w}) := \int \left[ \sum_{i=1}^{12} w_i K_{i,j}(\mathbf{x}) \right]^2 d^3 \mathbf{x} \quad , \text{with} \quad \sum_{i=1}^{12} w_i^2 = 1$$

Optimisation:

$$\hat{\mathfrak{S}} := \mathfrak{S}_1 - \sum_{j \neq 1} \mathfrak{S}_j$$

Lagrange function:

$$\mathfrak{L}(\mathbf{w}, \lambda) := \hat{\mathfrak{S}}(\mathbf{w}) + \lambda \left( \sum_{i=1}^{12} w_i^2 - 1 \right)$$