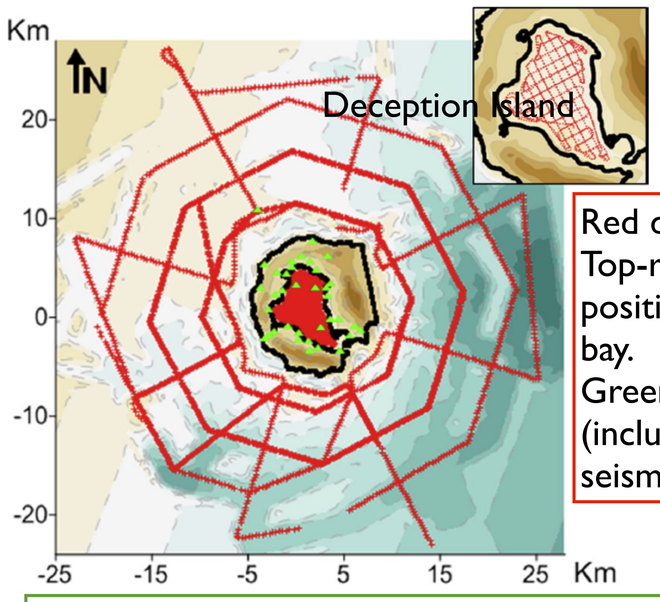
Separate intrinsic- and scattering-Q images of volcanoes using scattered waves: a renewed method applied to Deception Island volcano.

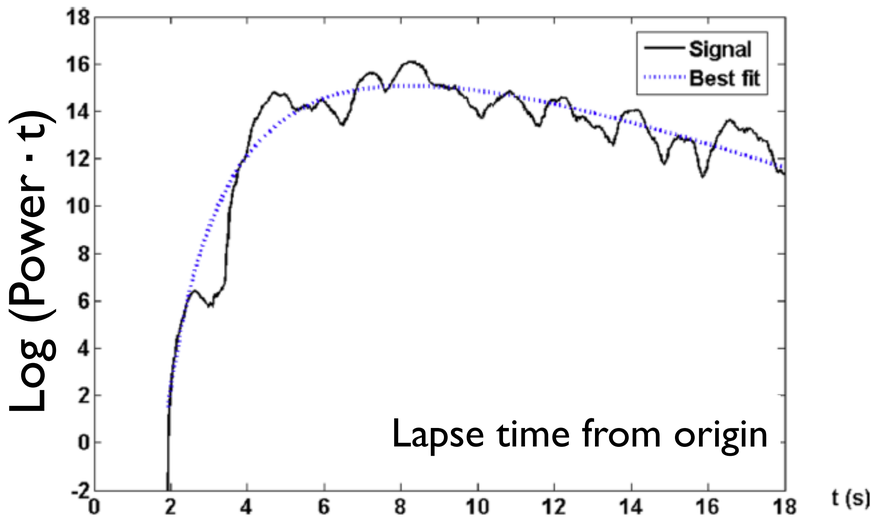
E. Del Pezzo[1,2], F. Bianco[1]. Prudencio[2], J. Ibanez[2]
1) INGV - Sezione di Napoli "Osservatorio Vesuviano"
2) Instituto Andaluz de Geofisica - Universidad de Granada (España)

★Earth Images using: Scattering tomography
★Scattering Model: Energy Transfer Model in the "diffusion" asymptotic approximation
★Data: Seismograms from artificial shots fired in the sea.
★Seismogram Attributes: Energy Envelopes
★Parameters from inversion: Intrinsic- and Scattering-Q
★ Target area: Deception Island Volcano, Antarctica

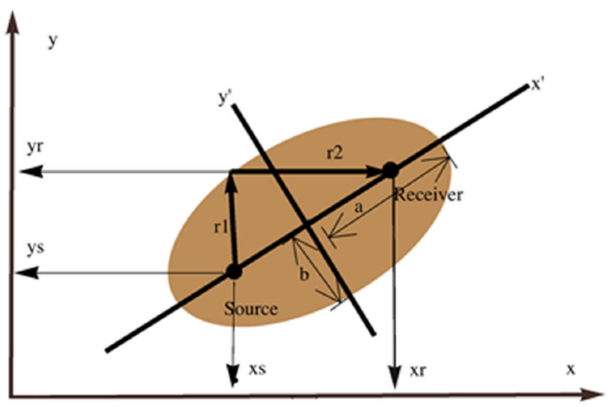


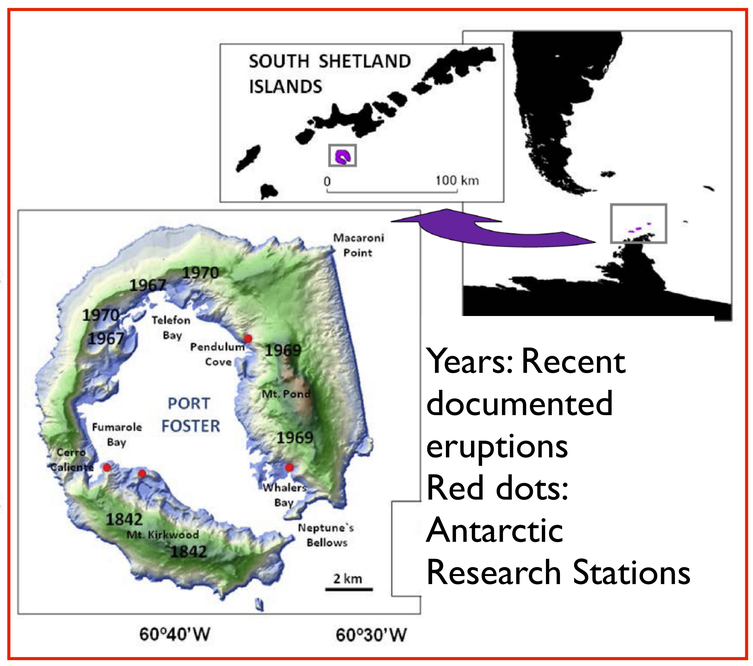
Red dots: Shot positions
Top-right inset: Shot position inside deception bay.
Green triangles: Receivers (including OBS seismometers)

Data Analysis:
•Black curve: Energy Envelopes seismograms , averaged over the three components after filtering in frequency bands centered at fc=4,6,8,12,16 and 20 Hz with bandwidths of fc ±0.6fc
•Blue dotted curve: Theoretical best fitting curve. Two parameters inferred by the fit: Qi - intrinsic-Q and Qs - scattering-Q. Qi and Qs are characteristic of a 2D ellipse with foci in the receiver and source.



• Scattering ellipse in which the scattering phenomena produce the observed seismogram.
•The sensitivity kernel for scattered waves is assumed of Gaussian shape. a=3σa; b=3σb. Outside the scattering ellipse the probability that the Qi and Qs couple estimated for the single receiver-source couple is close to zero.





Years: Recent documented eruptions
Red dots: Antarctic Research Stations

Images