## imaging the crust and upper mantle in the southern central mediterranean with joint ambient noise and earthquake surface wave tomography F. Eckel<sup>1</sup> | A. El-Sharkawy<sup>1,2</sup> | G. Barberi<sup>3</sup> | L. Scarfi<sup>3</sup>

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Surface wave tomography can image the seismic velocity distribution in the crust and upper mantle. It does not require local earthquakes to do so.

Instead, phase velocities are measured using cross correlations of **ambient noise** (AN) [fig ①] or teleseismic earthquakes (EQ) [fig 2] between pairs of stations.

Phase velocities are frequency dependent. This is called **dispersion**. Lower frequencies are sensitive to larger depths and higher frequencies to smaller depths.



Therefore, local dispersion curves for every point in a grid are **extracted and inverted** for depth. A particle swarm optimization algorithm ensures the determination of the **best model** [fig and ].

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These phase velocity measurements are inverted into phase velocity maps [fig 3] displaying velocity variations at certain frequencies. However, no instantaneous depth information is available from these maps.



