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Global azimuthal anisotropic phase velocity maps for higher modes of Love and Rayleigh waves

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It is well established that the Earth's uppermost mantle is anisotropic, but there are no clear indications of anisotropy in the deeper parts of the mantle. Surface waves are well suited to observe anisotropy since they carry information about radial and azimuthal anisotropy. Fundamental mode surface waves, for commonly used periods up to 200s, are sensitive to the fist few hundred kilometers and therefore do not provide information on anisotropy below. Higher mode surface waves have sensitivities that extend to and beyond the transition zone and should thus give insight about azimuthal anisotropy at greater depths. We measured higher mode Love and Rayleigh phase velocities using a model space search approach which provides us with consistent relative uncertainties from measurement to measurement and from mode to mode. From these phase velocity measurements, we constructed global anisotropic phase velocity maps. Prior to the inversion, we find the optimum relative weighting for anisotropy. We present global azimuthal phase velocity maps for higher mode Rayleigh (up to the sixth higher mode) and Love (up to the fifth higher mode) waves.