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Probing seismic anisotropy in the lowermost mantle beneath the Central Atlantic Ocean

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The D" region, the lowermost part of the Earth's mantle, exhibits complex structures which have been related to slabs graveyard and birth place of uprising plumes all through the mantle. These structures are likely due to flow in the mantle and investigating the anisotropy can help to determine flow and mineralogy of the D". Azimuthal anisotropy, rather than simple vertical transverse isotropy, have been recently detected using either shear wave splitting or polarities from reflected waves from the D" discontinuity. In this work, we use both methods in order to better constrain anisotropy and deformation in the lowermost mantle beneath the Atlantic Ocean.
We find a reflector in the lowermost mantle that shows a complex pattern in reflected wave polarities that in some cases travel out-of-plane. Applying ScS-S differential splitting method, we also detect a tilted fast polarization. Back projecting waves to their original bounce points, modelling out of plane waves, finding cross paths and modelling of anisotropy, will help us to better understand structure and flow of the lowermost mantle beneath the Atlantic Ocean.