Structural hydroxyl contents of nominally anhydrous minerals in peridotite xenoliths and their geophysical importance, Perşani Moutains Volcanic Field, Transylvania (Romania)

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Hydrogen can be incorporated as structural hydroxyl in nominally anhydrous minerals (NAMs), where it is located in vacancies often coupled to trivalent cations in different crystal structural positions. Structural hydroxyl content of olivine and pyroxenes significantly influences the rheology of the lithospheric mantle thus its deformation behaviour as well. Seismic wave velocity (Vp and Vs) and electric conductivity can be calculated by using xenolith modes along with their mineral chemistry and structural hydroxyl content. These results can then be compared in a 2D section to those of independent geophysical measurements.

In this study we focus on xenoliths from the Gruiu locality, presenting structural hydroxyl data for our better understanding on the connection between deformation, geophysical and geochemical properties underneath the Perşani Montains Volcanic Field. Studied xenoliths originate form a mantle wedge region that is close to the slab of the youngest, nowadays still ongoing subduction event in the Carpathian-Pannonian region, called Vrancea zone. Ultimately, these pieces of information provide a novel insight into dynamics of the upper mantle beneath the seismically extremely active Vrancea zone.