

## **Mantle Deformation Below a Back-Arc Continental Rift: Example from the Ronda Peridotites**

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The Ronda continental peridotite (southern Spain) exposes several ductile structures formed at different metamorphic facies with very debated geodynamical signification. Spinel tectonite and a spinel/garnet mylonite are exposed in the Northern rim of the massif while plagioclase tectonite are present in the southern part of the massif. These two domains are separated by a partial melting-related granular peridotite. A new structural study of the massif has thus been made in order to better constrain all deformations. The foliation in the spinel tectonite becomes progressively parallel to the contact with the country rocks, imaging a kilometre-scale shear zone. Consistently, pyroxenite layering are folded in the less strained rocks while they are parallel to the foliation and strongly stretched in the garnet mylonite. Furthermore, Mylonite foliation is parallel to the main foliation in the strongly thinned crustal rocks on the top, suggesting an overall deformation of the crust and mantle during an extensional event. As for the plagioclase peridotites, local mylonite and further folds suggest another deformation but not clearly different from the latter. Finally, thrusts with numerous crustal imbrications at the base of the peridotite massif cut and fold the plagioclase foliation, indicating a late and cold deformation related to the massif emplacement into the crust. Thereby, we propose that most of the ductile deformation of the Ronda peridotites are formed during lithosphere extension related to the Oligocene African slab roll-back with, successively, a mantle shear zone in the garnet/spinel facies, a partial melting, then a deformation in the plagioclase facies at the end of the unroofing. Finally, a compressive event integrated the Ronda massif into the crust when it was at midcrustal depths.

Keywords: Peridotite; Ronda; ductile deformation; extension.