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Ductile strain rate recorded in the Symvolon syn-extensional plutonic body (Rhodope core complex, Greece)

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The present contribution deals with quantitative microstructural analysis, which was performed on granodiorites of the syn-tectonic Symvolon pluton (Punturo et al., 2014) at the south-western boundary of the Rhodope Core Complex (Greece). Our purpose is the quantification of ductile strain rate achieved across the pluton, by considering its cooling gradient from the centre to the periphery, using the combination of a paleopiezometer (Shimizu, 2008) and a quartz flow law (Hirth et al., 2001).
Obtained results, associated with a detailed cooling history (Dinter et al., 1995), allowed us to reconstruct the joined cooling and strain gradient evolution of the pluton from its emplacement during early Miocene (ca. 700°C at 22 Ma) to its following cooling stage (ca. 500-300°C at 15 Ma). Shearing temperature values were constrained by means of a thermodynamic approach based on the recognition of syn-shear assemblages at incremental strain; to this aim, statistical handling of mineral chemistry X-Ray maps was carried out on microdomains detected at the tails of porphyroclasts.
Results indicate that the strain/cooling gradients evolve “arm in arm” across the pluton, as also testified by the progressive development of mylonitic fabric over the magmatic microstructures approaching the host rock.

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