



Petrological microscopy data workflow – an example from Cap de Creus, NE Spain

Richard Wessels, Thijmen Kok, Hans van Melick, and Martyn Drury

Utrecht University, Department of Earth Sciences, Utrecht, The Netherlands (r.j.f.wessels@uu.nl)

Publishing research data in a Findable, Accessible, Interoperable, and Reusable (FAIR) manner is increasingly valued and nowadays often required by publishers and funders. Because experimental research data provide the backbone for scientific publications, it is important to publish this data as FAIRly as possible to enable reuse and citation of the data, thereby increasing the impact of research.

The structural geology group at Utrecht University is collaborating with the EarthCube-funded StraboSpot initiative to develop (meta)data schemas, templates and workflows, to support researchers in collecting and publishing petrological and microstructural data. This data will be made available in a FAIR manner through the EPOS (European Plate Observing System) data publication chain (<https://epos-msl.uu.nl/>).

The data workflow under development currently includes: a) collecting structural field (meta)data compliant with the StraboSpot protocols, b) creating thin sections oriented in three dimensions by applying a notch system (Tikoff et al., 2019), c) scanning and digitizing thin sections using a high-resolution scanner, d) automated mineralogy through EDS on a SEM, and e) high-resolution geochemistry using a microprobe. The purpose of this workflow is to be able to track geochemical and structural measurements and observations throughout the analytical process.

This workflow is applied to samples from the Cap de Creus region in northeast Spain. Located in the axial zone of the Pyrenees, the pre-Cambrian metasediments underwent HT-LP greenschist- to amphibolite-facies metamorphism, are intruded by pegmatitic bodies, and transected by greenschist-facies shear zones. Cap de Creus is a natural laboratory for studying the deformation history of the Pyrenees, and samples from the region are ideal to test and refine the data workflow. In particular, the geochemical data collected under this workflow is used as input for modelling the bulk rock composition using *Perple_X*.

In the near future the workflow will be complimented by adding unique identifiers to the collected samples using IGSN (International Geo Sample Number), and by incorporating a StraboSpot-developed application for microscopy-based image correlation. This workflow will be refined and included in the broader correlative microscopy workflow that will be applied in the upcoming EXCITE project, an H2020-funded European collaboration of electron and x-ray microscopy facilities and researchers aimed at structural and chemical imaging of earth materials.

