A thermometric database for the Eastern Alps based on Raman spectroscopy on carbonaceous material (2002–2022)

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Since 2002, Raman Spectroscopy on carbonaceous material (RSCM) was applied in carbonaceous material-bearing meta-sediments of the Eastern Alps to explore the tectono-metamorphic history of cover and basement rocks involved in the orogeny. After establishing a general correlation between spectral parameters and peak metamorphic temperatures by Beyssac et al. (2002), major methodological progress was achieved by the development of the “Interactive Fitting of Raman Spectra” (IFORS) approach of Lünsdorf et al. (2017), providing a standardized analytical protocol to estimate error validated metamorphic temperatures between 160 and 600 °C. This technique allows the effective thermometric mapping within major parts of the Eastern Alps. The implementation of this approach initiated the cooperation of the Leoben Raman-lab with the Geological Survey of Austria (GBA). During this work, stratigraphically, tectonically, and kinematically well-constrained samples were investigated. From the results, a map-based database was created, which allows plotting the data at geological maps in different scales. The presentation shows the current state of the map, including all RSCM data of the last two decades analyzed in the Leoben Raman-lab. The data allow a much better coverage of the pre-Alpine, Eoalpine and Alpine metamorphic zoning in the units of the Eastern Alps and support recent mapping projects of the GBA. Partly they are already published.