Deformation and peak-metamorphic temperature in Kodiak accretionary complex, Alaska

Kristijan Rajic [*1,2,3], Hugues Raimbourg [1,2,3], Vincent Famin [4], Donald Fisher [5], Kristin Morell [6]

[1] Université d'Orléans, ISTO, UMR 7327, 45071 Orléans, France
[2] CNRS, ISTO, UMR 7327, 45071 Orléans, France
[3] BRGM, ISTO, UMR 7327, 45071 Orléans, France
[4] Laboratoire Géosciences Réunion, Université de La Réunion, IPGP, Sorbonne Paris Cité, UMR 7154 CNRS, Saint-Denis, La Réunion, France
[5] Department of Geosciences, Pennsylvania State University, University Park, PA 16801, USA;
[6] Department of Earth Science, University of California, Santa Barbara, Santa Barbara, CA 93106, USA

The Kodiak archipelago (Southwest Alaska) represents a well exposed paleo-accretionary prism with its modern equivalent further to the southeast as the Alaskan Trench (Plafker, 1994). The complex consists of northeast-trending metasedimentary and magmatic rocks, whose age span from the oldest Triassic-Jurassic units exposed at northwestern side of the archipelago towards the youngest, Miocene at the southeast. The complex dominantly consists of trench sediments, in which the sedimentary stratification is still visible. In addition, two tectonic mélange zones, composed of lenses of metabasites embedded in sheared metasediments, are intercalated in between the coherent formations. Melange terrains are characterized by subduction-related deformation, top-to-the-trench shear zones. On the other side, dominant structures in coherent units are conjugate thrust faults and folds, related to the intra-wedge shortening.

Preliminary results of Raman spectroscopy of carbonaceous material (RSCM) provide essential information as to the large-scale thermal structure of the accretionary prism. **(1)** In the investigated profile running from southeastern margin towards the northwest, the temperature does not increase monotonically towards the inner part of the wedge. The highest temperatures (>300 °C) are found within the central part of the complex, in very thick early Maastrichtian turbiditic series accreted in a short period of time in Paleocene. **(2)** There is a large thermal gap at the regional-scale unconformity between the youngest accreted sediments early Eocene in age and Oligocene slope sediments. This points to a tectonic event including rapid accretion in Eocene, followed by fast uplift and erosion, subsidence and finally slope sedimentation in Oligocene. **(3)** There is no thermal gap across the Uganik Thrust, a major tectonic fault, what indicates that its activity predates exposure to the peak temperature.

Mots-Clés : Kodiak, accretionary prism, subduction, Raman spectroscopy, geothermometer

Merci de ne rien inscrire dans cette zone et ne pas modifier les marges des pieds de page et entêtes.