Geophysical Research Abstracts
Vol. 20, EGU2018-7973-1, 2018
EGU General Assembly 2018

Interactions between foreland basin and collisional wedge in the Western Alps: new sedimentological, structural and thermochronological data.

Jean-Baptiste Girault (1), Nicolas Bellahsen (1), Nicolas Loget (1), Eric Lasseur (2), Renaud Couëffe (2), Claudio Rosenberg (1), Matthias Bernet (3), and Raphael Pik (4)

(1) Sorbonne Université, CNRS-INSU, Institut des Sciences de la Terre Paris, ISTeP UMR 7193, F-75005 Paris, France (jean-baptiste.girault@umpc.fr), (2) BRGM, Orléans, France, (3) Université de Grenoble, ISTERRE, Grenoble, France, (4) Université de Lorraine, CRPG, Nancy, France

The Western Alps are key places to investigate the relationship between the collisional crustal wedge and the foreland basins. The tectono-sedimentary study of foreland basin (i.e. molasse basin) and the structural analysis of the orogeny are helpful for understanding the timing, mechanisms, exhumation, erosion and dynamics of the fold-and-thrust belt.

However, this area has been relatively less studied from this perspective. Thus, first-order questions remain unanswered: Why is the Western Alpine molasse basin (i.e. “french molasse basin”) much smaller than the Northern Alpine molasse basin? What is the internal structure of this western basin? Are there any « sub-basins »? What is the precise age of initiation of the thrusts of the external zones? What are the flow directions and the corresponding reliefs? What is the mass-balance between accreted, eroded and deposited material?

The structural sequence of the External Alps is relatively well known, especially in the fold-and-thrust belt between the External Crystalline Massifs (ECM) and the foreland basin. However, the thermal history of the ECM and the sedimentary record in the « sub-basins » remains to be documented in details.

We focused our study on the Oligo-Miocene basins between Chambéry and Geneva for which field stratigraphic logs are presented. This approach is completed with the interpretation of seismic profiles available in this area. New paleogeographic maps are compiled to discuss the chronology of deformations in the basin. Finally, these data are coupled with thermochronological data (ZFT and ZHe of the ECM and detrital rock samples) in order to more accurately date the thermal and structural history of the Western Alps since 30 Ma.

These data will allow to understand the links between the evolution of the Alpine collisional wedge and the dynamics of the foreland basin for which the timing and the localization of deformation are critical parameters, parameters that are very different in the Western and Central Alps.