



**HAL**  
open science

## Salt tectonics and thermal imprint along an inverted passive margin: the Montcaou anticline, Chaînons Béarnais, North Pyrenean Zone

Armel Menant, Charles Aubourg, Jean-Baptiste Cuyala, Guilhem Hoareau, Jean-Paul Callot, Eve Péré, Pierre Labaume, Maxime Ducoux

### ► To cite this version:

Armel Menant, Charles Aubourg, Jean-Baptiste Cuyala, Guilhem Hoareau, Jean-Paul Callot, et al.. Salt tectonics and thermal imprint along an inverted passive margin: the Montcaou anticline, Chaînons Béarnais, North Pyrenean Zone. EGU General Assembly 2016, 2016, Vienne, Austria. hal-03551124

**HAL Id: hal-03551124**

**<https://hal.science/hal-03551124v1>**

Submitted on 1 Feb 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

## **Salt tectonics and thermal imprint along an inverted passive margin: the Montcaou anticline, Chaînons Béarnais, North Pyrenean Zone**

Armel Menant (1), Charles Aubourg (1), Jean-Baptiste Cuyala (2), Guilhem Hoareau (1), Jean-Paul Callot (1), Eve Péré (3), Pierre Labaume (4), and Maxime Ducoux (5)

(1) LFC-R, Université de Pau et des Pays de l'Adour, Pau, France, (2) Université de Pau et des Pays de l'Adour, Pau, France, (3) IPREM, Hélioparc, Université de Pau et des Pays de l'Adour, Pau, France, (4) Géosciences Montpellier, Université de Montpellier 2, Montpellier, France, (5) Université d'Orléans, ISTO, UMR 7327, Orléans, France

Resulting from the late Cretaceous-Tertiary Iberia-Eurasia convergence, the building of the Pyrenean belt followed a pre-orogenic period of rifting where the Eurasian margin was extremely stretched. The geometry and the evolution of this paleo-margin, now constituting the North Pyrenean Zone, remain however controversial. Although localized high-temperature deformation and isolated peridotite bodies have been related to crustal thinning, processes controlling the distribution of these hot paleo-temperatures and mantle outcrops are still unknown.

In this study we investigate the possible role of salt tectonics, recognized in the Aquitanian basin and the Pyrenean foreland, on the development of such thermal anomalies and the exhumation of peridotites bodies. We thus performed a detailed structural and thermal characterization of the region of the Montcaou anticline (Chaînons Béarnais, North Pyrenean Zone) where salt structures have been already described. We propose balanced geological cross-sections along this anticline displaying a peridotite body in its core, embedded in Triassic evaporitic deposits. In addition, to assess the thermal imprint occurring in this area, we measured a wide set of paleo-temperature proxies, using RAMAN spectrometry on carbonaceous material.

Intensively folded Jurassic and lower Cretaceous sedimentary formations (with evidences of overturned sedimentary sections), erosional unconformities and strong thickness variations in Urgonian limestones associated to the Montcaou anticline suggest a salt ridge or diapir growth since upper Aptian times. Superimposition of Pyrenees-related compressional deformation then allowed salt structure tilting and propagation of top-to-the-north thrust faults. In this region, the distribution of thermal anomalies (up to 420 °C), as well as occurrences of high-temperature scapolite minerals, seems correlated with these salt structures. Indeed, high thermal conductivity of salt material could enhance the ascent in the upper crust of high temperatures resulting from the extreme crustal stretching.

These results suggest that the early development of salt ridges and diapirs along the stretched Eurasian paleo-margin allowed to localize (1) rift-related thermal anomalies and (2) Pyrenees-related compressional deformation, thus controlling the present-day structuration of the Chaînons Béarnais. In addition, correlation of peridotites and salt occurrences in this area (e.g. the Sarrance anticline) also suggests that salt tectonics may be an efficient process to transport such mantle bodies as isolated rafts.