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## Salt tectonic in the western subalpine foreland basin of Haute Provence? New insights on the Miocene Vélodrome syncline by a 3D geometrical modelling approach

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Recently, the understanding of the role of salt dynamics in the evolution of fold-and-thrust belts and foreland basins has significantly improved with the development of high-resolution seismics. Understanding a salt-related structure in the field as a mini-basin requires a thorough understanding of the 3-D geometries of folds.

In the western subalpine chain of Haute Provence, the Digne thrust area has undergone a complex tectonic history involving syn-sedimentary deformation, the migration of alpine front, late exhumation related to surface processes, and salt tectonics. In the front of the Digne thrust, the Vélodrome is an emblematic example of a complex fold displaying a 3D structure hardly explained by regional tectonics. The Vélodrome is an overturned syncline displaying a curved axis which direction changes from E-W in the north to N-S in the east and to E-W again in the south-eastern part. The Vélodrome is often interpreted as a growth fold with internal unconformities, but microstructural analyses (Fournier et al., 2008) have alternatively suggested a post-deposition folding. Moreover, recent studies (Graham et al., 2012; Celini, 2020) propose that the fold formed due to salt tectonics and interpret the Vélodrome as a mini-basin.

Thus, the Vélodrome complex tectonic structure requires a thorough understanding of the 3-D geometries to understand its tectonostratigraphic evolution.

This study aims at understanding the emplacement and the tectonic history of the Miocene Vélodrome series using *in-situ* field observations and drone field data to realize a 3-D geometrical model (GeoModeller - ©BRGM). More than 3000 structural data have been measured - both directly in the field and on 3D models obtained from drone image processing - and used in the GeoModeller to test the different hypotheses. The implicit approach offered by the GeoModeller and the field structural data-based approach bring an objective and new vision of 3-D geometries

of the Vélodrome basin and confirm the Vélodrome as a syn-sedimentary fold. This study highlights several discontinuities inter- and intra-formations spatially localized. In the north of the Vélodrome, Aquitanian deposits do not present any unconformity, whereas internal unconformities can be observed in Burdigalian deposits. In the southeast of the fold, we observed internal unconformities both in the Aquitanian and Burdigalian deposits. This leads us to propose an early salt-related episode of deformation in the southeast part of the fold (Aquitanian) compared to the north, where deformation began only during the Burdigalian.