

3D MODELING OF SIMPLE TO COMPLEX GEOLOGICAL STRUCTURES AND IMPLEMENTATION OF EDUCATIONAL TOOLS

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3D visualization only based on 2D illustrations is not a simple exercise for human brain. Teaching geology and the geometries of the geological layers is therefore, quite complicated.

This project aims to modelize in 3D a complex structure and its previous stages of formation in 3D (4 models) in order to facilitate the comprehension of the depositional and deformational processes responsible for its establishment.

The structure studied corresponds to the thrust anticline of Sellent, Spanish Pyrenees. A field campaign of 1 month allowed collecting geological data concerning the layers' geometries (dip and thickness measurements, geological mapping at a 1/5000 scale, ...). These data led to the construction of 6 geological sections which, combined with the Digital Terrain Model (DTM), were used to construct the current 3D model of the area using the 3DEXPERIENCE© platform developed by Dassault Systèmes (Figure 1). Complementary bibliographical researches allowed constructing in 3D the 3 previous major stages of the formation of this geological structure.

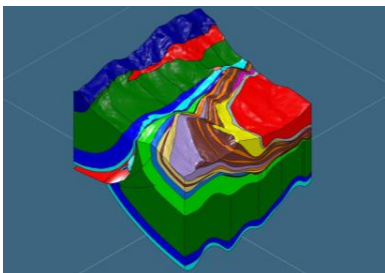


Figure 1 : Geological 3D model of the Sellent anticline (final stage)

These 4 models can be digitally manipulated thanks to a visualization application so that the geometries induced by such a deformation of the geological layers can be easily appreciated. Moreover, the models will be 3D-printed and used during mapping or tectonic lessons with the students.

On the same purpose, other similar projects are simultaneously being realized and are leading for example to the 3D-printing of simple normal faults and associated tectoglyphs models.