



## **Use of Laser-DTM for geological survey, structural interpretation and update of existing maps**

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The Digital Terrain Models (DTMs) give several new tools for geological mapping and structural interpretation. The high resolution of these new DTMs (1 point per 1 to 2 m<sup>2</sup>) and makes possible the detection and the precise mapping of geological limits as well as tectonic structures. The studied area is located in the Jura Mountains of Switzerland, more precisely on the crest of a kilometer-size detachment anticline, the Mont-Tendre anticline. The folded series are made up of well bedded Jurassic to Cretaceous sedimentary formations. The goal of this work is to update the geological map at the scale of 1:25'000. The limits of some formations have first to be precisely located in the field thanks to GPS measurements. Combined to a pocket PC, this allows a direct check of the eventual misfit between the published document and the actual position of the limits. The geological limits can then directly be followed using the high precision of the DTM even in forested areas. Several tectonic features, mainly minor strike-slip faults, that are invisible in the field can be detected and mapped with the Laser-DTM. Analysis and quantification of the meter to decameter scale fracturing can be carried out using these new data. Finally, the exact location and precise geometry of second order folds can also be obtained. In a specific geologic environment, the DTM interpretation will improve and make geological mapping easier. It will help to identify small tectonic structures, such as minor folds and faults. It will result in more detailed geological maps with less time involvement than traditional mapping. These new maps can be used either for academic (for example model of detachment folds) or practical purpose (fracturing in relation with hydrogeology). The geological mapping will be completely modified in the next years by such methodology.