

**Static analysis of the disarrangement of a building for the cult:  
San Lorenzo in Traverses of Pragelato**

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Pragelato, is set to around 80 Kms from Turin, it extends him in the superior part of the culminating Val Chisone with the Hill of Sestriere, between the 1500 and the 3047 meters of the Albergian Mountain.

In the fraction of Traverses it is situated the church of San Lorenzo, already existing in four hundred, then reconstructed in 1688.

The church introduces particular lesions on the east front and on the times to the inside. to analyze the behavior of the structure and the cause of these fessurazionis I have had to verify the ground on which San Lorenzo has been built. I have reached the conclusion that the whole slope is unstable and therefore there is a yielding of the ground toward valley that determines the I degrade of the church.



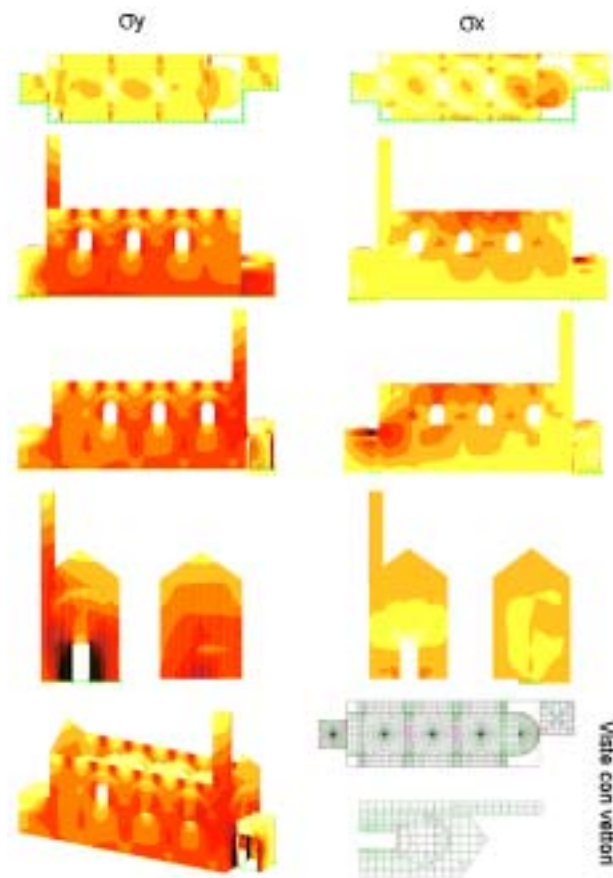
The church of San Lorenzo in Travereses

For the study of the structure I have chosen an elements methodology ended from which he could emerge the global behavior under static conditions of the church. I have inserted in the model to the ended elements all that elements of vulnerability, of which I have come to knowledge, that they surely will influence the behavior of the structure in the study. And' uses the program of calculation to ended elements DOLMEN WIN of the CDM Dolmen in Turin.

The chosen possession a church geometrically not too much complex and the possession inserted such vulnerabilities has certainly influenced in positive way the goodness of the results of the static analysis, resulted that I have been drawn by a based study on an elements methodology ended and that therefore, however with a critical approach must be interpreted for the impossibility to know in absolute way the connection between the different parts of the building and the difficulty to represent the behavior of the masonry.

The church of San Lorenzo was built on the border of a conoide that was formed thanks to the waters that flowed out from the superior valley. To define this typology is very important to be able to study the church, in fact we can say that the ground below the church will be composed from a superior layer eluvio colluviale and as soon as he goes to depth a layer of deposits of alluvial conoide it will generally be had composed by sands gravels and small rocks, the layer of rock will finally be reached. The presence of these materials determines diffused phenomenons of instability in the slope. The whole slope is interested from a yielding toward valley. The most evident cracks in the church of San Lorenzo are visible on the east front (principal) where an almost vertical crack can be individualized that departs from the door of entry and it finishes on the roof. The characteristics of the crack allow to hypothesize that the principal cause is constituted by the movement of the ground toward valley.

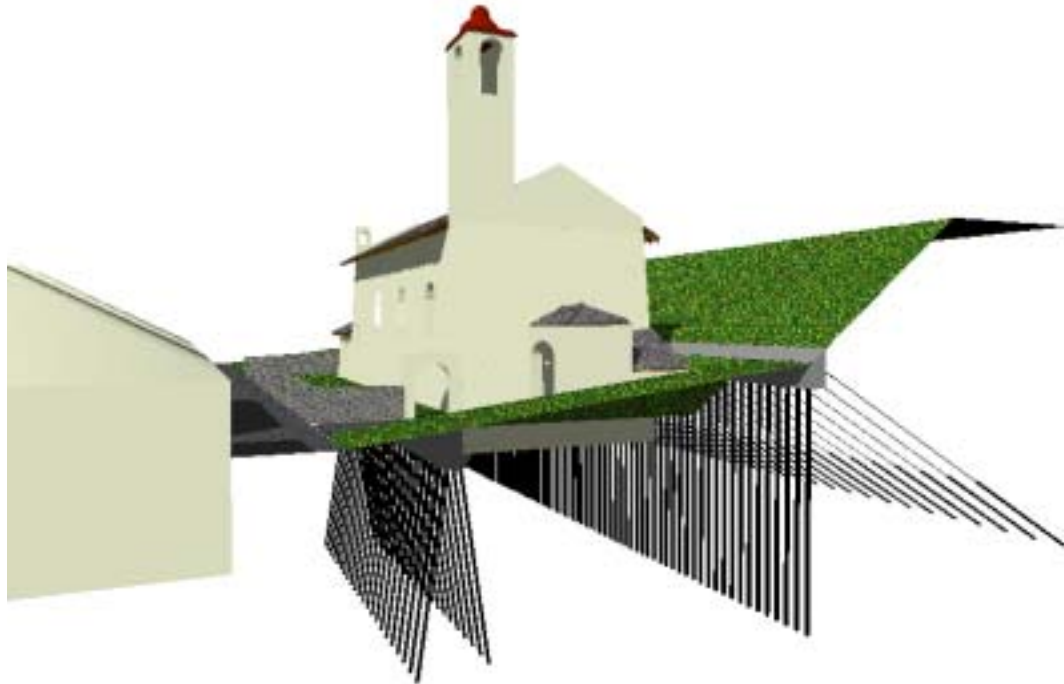
I have departed from the study of the model FEM of the church without lesions and I have observed the behavior of the structure. With the insertion of the yeldings of foundation I have begun to see interesting results.



Study of the normal tensions in direction x and y

Continuing with the study of the model I have reached a situation very similar to the reality, which she has confirmed the fact that the whole slope is unstable and more particularly that the ground on which the church has been built is surrendering toward valley.

In this geologic situation and geomorfologica it is necessary to absorb the due horizontal and oblique strengths to the glide of the ground toward valley, a good solution it is that of the tilted micropalis. The pushes of the ground can entirely be annulled by a system of "submerged elementary reticolari" compotes every from an oblique connecting rod and from a vertical strut. Studying the section of the ground is chosen to position awry immediately the micropalis of the church and at the base of the underlying building the church.



Three-dimensional vision of the section of the ground with the insertion of the micropalis.

To assure a greater stability to the church they will be realized some micropalis under the foundation of the wall perimetrale that has suffered the lowering.

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