

ABSTRACT

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The aim of this undergraduate project is to apply the “Eraso” method in order to determine the different directions filtration takes in rocky mass placed in a dam.

This is a predictive way, which consists of applying the method in order to check whether the results are good. The “Camarasa” dam has been chosen because from its beginnings there had been a lot of problems of filtration. These were so important that the dam lost the same quantity of water that ran into the dam by the river, then the hydroelectric exploitation was useless. Therefore, the “Camarasa” dam offers an appropriate background for the application of this method.

The “Eraso” method determines the directions of the traction of the rocky mass from the microstructural geologic data, such as the fault directions, traction cracks or stilted peaks. From them we will work out the stress tensor from the mass in different points. The direction of the traction will match the directions from the tension from the minor main term for each point of calculation.

First of all, we have gone to the particular place and we have made a study from the geologic place in order to fulfil the project. We have to locate and measure all the different geologic elements we need. It is very useful to find the conjunctions in these elements; that is, the interactions among several of these geologic elements such as conjugate faults, intersections in traction crack-fault, etc.

In order to measure these elements -- maps of discontinuity in the land -- we took their layer and dip directions and the dip angle.

Once the land work has finished we process all that data. In order to apply the method we are going to use the combination of seven little programmes designed by the method’s author, and some texts in the “Fortran” language.

Once the data entered and all the programmes applied, we get a tension tensor and a drainage direction for each point of the study. Afterwards we make an statistics study in order to determine the usual directions. To do so we will use the stereographic projection, we will represent all the drainage maps that the application of the method offers us, and through a density diagram we will be able to determine the most common ones. Those will be considered the solution of the method’s drainage maps.

The only thing missing is to verify whether those solution drainage maps coincide with the filtration phenomena happened in Camarasa. After an investigation essay we find data from the construction period of the dam, where a lot of sources are registered, and the dam level on its very first moment, relationships among drilling points and some sources, visual data got from the geologic recognition from the Camarasa dam, etc.

From all these data, we can extract some drainage directions that will be useful in order to compare to those obtained from the application of the Erasos method. As we will see in the conclusions from this undergraduate project, the different drainage maps coincide. Then, we will accept the Erasos method as valid.