

Analysis of the Geodetic Network Deformations of Chelif Region by Two-Dimension Elastic Finite Element Method

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ABSTRACT

The two main classes of solutions used to quantify and to represent the geodetic network deformations are the displacement vectors and the strain tensors. The analysis of these two solutions depends, respectively, on the a priori reference frame and on the configuration of the chosen figures, which unfortunately make difficult the interpretation of the results (Pagarette et al., 1990 and Million, 1993).

The proposed solution, through this article, is based on a more improved analysis of the geodetic network deformations using the finite element method (FEM).

The realised tests are about the study of the horizontal movements of the seismic zone of Chelif (ex. El Asnam). The used data are the terrestrial geodetic measures of two observations campaigns done in 1976 and 1981 (Ruegg et al., 1982). The considered model is a two-dimensional model of elastic finite elements and the adopted grid is constructed according to quadrilaterals.

The different results are presented in terms of displacement vectors, forces of reaction, strain tensors and stress tensors.

The analysis of the these different parameters has put in evidence the following phenomena:

- A compressive phenomenon of the region of Chelif due to the inverse fault of the famous earthquake of 10 October 1980, in the NNW-SSE orientation.
- A block rotation phenomenon, in the Southeastern and Northwestern parts of the fault zone, in the retrograde direction.

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