GPS network design based on strain tensor quality and delaunay triangulation, using genetic algorithms for geodynamics

M. Shirzaii (1,2), M. Zolfaghari (2,3)

(1) International Institute of Earthquake Engineering and Seismology, Tehran, Iran, (2) Research Institute of Geomatics and Spatial Information of Amirkabir University of technology, Tehran, Iran, (3) Academic member of Amirkabir University of Technology And University of Tehran, Tehran, Iran, (m.shirzaii@iiees.ac.ir / m_shirzaii@engineer.com / Fax: +98 21 22299479)

This paper deals with the optimal design of GPS network for deformation surveying. Objective function for minimization is derived base on strain tensor and deformation parameters quality. Delaunay triangulation in finite element scope is used for approximating discrete displacement field and optimization tool is the Genetic Algorithm based on the principle of genetics as an intelligent method. The object of this paper is to find the optimal configuration of GPS network (with constant number of stations) in view of obtaining the highest possible precision in determining the deformation parameters and strain tensor. Finally some results of GPS network design for central alborz and north part of Tehran, and comparison with the existing GPS network have been presented.