



## **Effect of groundwater level changes on geodetic observations: case study of Tehran basin, Iran**

**Y. Djamour** (1) and R. Bayer (2)

(1) Geodesy and surveying Dept., National Cartographic Center, Tehran, Iran, (2) Laboratoire Dynamique de la Lithosphere, University of Montpellier II, Montpellier, France  
(y-djamour@ncc.neda.net.ir / Fax: +98 21-6001972 / Phone: +98 21-6001090)

The aquifer system of Tehran is located to the south side of Central Alborz. This basin is built on a Plio-Quaternary unconsolidated sediments about 50 km large from the north to the south. The formation of this foreland basin is associated with Alborz mountain structure. This basin is affected by numerous active thrusts in Plio-Quaternary time. The Tehran aquifer is charged mainly by Karaj and Kan alluvial cones.

In this work we compare groundwater level changes with several geodetic observations such as gravity and GPS time series, as the principal geodetic data, and also leveling and InSAR interferometry on the metropolis of Tehran and try to describe the relation between them. For this study we used monthly groundwater level records of 70 groundwater-monitoring wells from 1992 to 2002.

First, we investigated the vertical coordinate time series of the permanent GPS Tehran site from 2000 to end of 2003, as the main geodetic observation, and found a seasonal variation within 5-7 mm in amplitude related to the groundwater level variations beneath the site. Next, we investigated three gravity measurements in 2000, 2001 and 2002 which seem to be in agreement with the groundwater level variations during these years. This study is based on a 1D simple poroelastic model for the vertical movements due to the groundwater level changes.