

# Topics in Geodesy

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This special issue contains 10 papers submitted by several research groups discussing various topics in Geodesy, providing an overview of different subject areas. First, a methodological approach is done for robust estimation applied to geodetic networks. In this topic, the establishment of GPS networks is an important advance to monitor ground deformations in active areas. In this volume, details about a GPS monitoring network established in the central part of the Betic Cordillera (Spain) are given and the results corresponding to the regional network are presented. The use of satellite missions plays a critical role to monitor the global oceans for scientific purposes as well as navigation. Thus, some papers are devoted to satellite missions, where an interesting experiment for altimeter calibration of satellites TOPEX and JASON-1 is reported in one paper, which is then applied for geoid determination as well as for mean sea level studies in the Mediterranean sea. To extract texture features and the subsequent classification of aerial and satellite digital images, one paper analyzes several alternatives for the application of Gabor filters. Some advances are presented for local studies of mean sea level and ocean tides. On the one hand, a study is focussed on the accurate determination of local mean sea level, through precise evaluation of nonlinear interactions in shallow water tides at the North of Spain. On the other hand, two methods for computation of surface displacements, tilt and gravity variations at the Earth's surface produced by ocean tide loading are reviewed. Other interesting topics related to the Earth's gravity field are touched. Thus, a paper dealing with interpretation of the local gravity anomalies, done with 3-D inversion based on genetic algorithm, associated with the recent volcanism in El Hierro island is added. By using both a classical elastic and an elastic-gravitational model deformation and gravity changes in Long Valley caldera are interpreted and, then, genetic algorithm inversion technique and micro-gravity data are used to model the source of inflation. Finally, variations of the gravity vector are studied by absolute gravity measurements made in Spain.