

2015 · VOLUME 9 · NUMBER 1

JOURNAL OF APPLIED GEODESY

EDITORS-IN-CHIEF

Heribert Kahmen, Vienna

Chris Rizos, Sydney

EDITORIAL BOARD

Xiaoli Ding, Hong Kong

Andreas Eichhorn, Darmstadt

Naser El-Sheimy, Calgary

Linlin Ge, Sydney

Dorota Grejner-Brzezinska, Columbus

Cheinway Hwang, Hsinchu

Allison Kealy, Melbourne

Hansjörg Kutterer, Hannover

Xiaolin Meng, Nottingham

Gyula Mentés, Sopron

Hans-Berndt Neuner, Vienna

Wolfgang Niemeier, Braunschweig

Alexander Reiterer, Freiburg

Guenther Retscher, Vienna

Volker Schwieger, Stuttgart

Andreas Wieser, Zürich

Caijun Xu, Wuhan

DE GRUYTER

JOURNAL OF APPLIED GEODESY is a forum for peer-reviewed research articles in the area of application of geodesy to engineering and other natural sciences. It publishes innovative contributions on sensor developments, multi-sensor systems and sensor data fusion focusing on the capture of georeferenced data. Hence topics related to navigation and mobile mapping will also be covered. The scope includes optical and microwave 3-D measurement techniques and other sensors for geotechnical measurements. Furthermore, applied geodesy articles from all areas of satellite-based geodetic networks, deformation measurements, deformation analysis, modelling of local geodynamic processes and the development of intelligent alert systems, measurement techniques for large construction sites and mechanical engineering will be presented. With increased use of the tools of Artificial Intelligence for sensor control, sensor fusion and data analysis, manuscripts on these topics with a strong emphasis on applied geodesy will also be published.

All information regarding notes for contributors, subscriptions, Open access, back volumes and orders is available online at www.degruyter.com/jag.

ISSN 1862-9016 · e-ISSN 1862-9024 · CODEN JAGOCE

RESPONSIBLE EDITORS Prof. Dr. Heribert Kahmen, Institute of Geodesy and Geophysics, Vienna University of Technology, Gusshausstraße 27–29, 1040 Vienna, Austria.
Email: journal.of.applied.geodesy@degruyter.com

Prof. Dr. Chris Rizos, School of Civil and Environmental Engineering, University of New South Wales, Sydney NSW 2052, Australia.
Email: c.rizos@unsw.edu.au

JOURNAL MANAGER Lissy Czolbe, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany.
Tel.: +49 (0)30 260 05-380, Fax: +49 (0)30 260 05-250
Email: Lissy.Czolbe@degruyter.com

RESPONSIBLE FOR ADVERTISEMENTS Heiko Schulze, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany.
Tel.: +49 (0)30 260 05 – 358, Fax: +49 (0)30 260 05 – 264,
Email: anzeigen@degruyter.com

© 2015 Walter de Gruyter GmbH, Berlin/Munich/Boston

TYPESETTING Agnieszka Brzyska, PhD, Maria Curie-Skłodowska University, Pl. Maria Curie-Skłodowskiej 5, 20-031 Lublin, Poland

PRINTING Franz X. Stückle Druck und Verlag e.K., Ettenheim

Printed in Germany



Offenlegung der Inhaber und Beteiligungsverhältnisse gem. § 7a Abs. 1 Ziff. 1, Abs. 2 Ziff. 3 des Berliner Pressegesetzes: Die Gesellschafter der Walter de Gruyter GmbH sind: Cram, Gisela, Rentnerin, Berlin; Cram, Elsbeth, Pensionärin, Rosengarten-Alvesen; Cram, Margret, Studienrätin i.R., Berlin; Cram, Dr. Georg-Martin, Unternehmens-Systemberater, Stadtbergen; Cram, Maike, Berlin; Cram, Jens, Mannheim; Cram, Ingrid, Betriebsleiterin, Tuxpan / Michoacan (Mexiko); Cram, Sabina, Mexico, DF (Mexiko); Cram, Silke, Wissenschaftlerin, Mexico DF (Mexiko); Cram, Björn, Aachen; Cram, Ella Anita, Rentnerin, Berlin; Cram, Berit, Greifswald; Cram-Gomez, Susanne, Mexico DF (Mexiko); Cram-Heydrich, Walter, Mexico DF (Mexiko); Cram-Heydrich, Kurt, Angestellter, Mexico DF (Mexiko); Duvenbeck, Brigitta, Oberstudienrätin i.R., Bad Homburg; Fund, Dr. Sven, Berlin; Gädeke, Gudula, M.A., Atemtherapeutin/Lehrerin, Tübingen; Gädeke, Martin, Einzelunternehmer, Würzburg; Lubasch, Dr. Annette, Ärztin, Berlin; Schütz, Dr. Christa, Ärztin, Mannheim; Schütz, Sonja, Berlin; Schütz, Juliane, Berlin; Schütz, Antje, Berlin; Schütz, Valentin, Berlin; Seils, Dorothee, Apothekerin, Stuttgart; Seils, Gabriele, Journalistin, Berlin; Seils, Dr. Clara-Eugenie, Oberstudienrätin i.R., Reppenstedt; Seils, Christoph, Journalist, Berlin; Siebert, John-Walter, Pfarrer, Oberstenfeld.

Contents

Research Articles

Christoph Holst, Axel Nothnagel, Martin Blome, Philip Becker, Malwin Eichborn and Heiner Kuhlmann

Improved area-based deformation analysis of a radio telescope's main reflector based on terrestrial laser scanning — 1

Mahmoud Abd Rabbou and Ahmed El-Rabbany

Precise Point Positioning using Multi-Constellation GNSS Observations for Kinematic Applications — 15

Akram Affi and Ahmed El-Rabbany

An Innovative Dual Frequency PPP Model for Combined GPS/Galileo Observations — 27

Muwaffaq Alqurashi and Jinling Wang

Performance Analysis of Fault Detection and Identification for Multiple Faults in GNSS and GNSS/INS Integration — 35

Itzik Klein

Analytic Error Assessment of Gyro-Free INS — 49

Eirik Mysen

A mascon adjustment of the Earth's gravity field using GOCE gradiometer data — 63

