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ANALYTICAL DESIGN OF MOBILE COMPUTING GRAVIMETRY MODELS FOR MARINE OBJECTS

A.S. Devyatisilny, A.Yu. Konoplin, A.V. Shurygin

The paper addresses gravimetry on a marine moving object. It is noted that the central problem in solving this task is the issue of numerical differentiation of the measured function, aimed at high-precision estimates of kinematic motion parameters as a reference result. To achieve this, a methodology and computational procedure are proposed that differ significantly from the known ones. A demonstration example provided in the paper confirms the hypothesis regarding the spectrum of derivatives, which is sufficiently evidenced by the corresponding graphic material. Two forms of systems of differential (in terms of kinematic parameters) equations of gravimetry are presented. The defining feature of the covariance of the equations when interpreting motion in geocentric and ellipsoidal coordinate systems is shown. The possibility of a highly efficient solution to the problem of mobile gravimetry is confirmed by the results of a computational experiment.

Keywords: marine moving object, underwater vehicle, computational mobile gravimetry, coordinate system, measured function, numerical differentiation, covariance of equations, computational experiment.

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Information about the authors

DEVYATISILNY Aleksandr Sergeyevich, Doctor of Technical Sciences, Professor, Chief Researcher
Institute of Automation and Control Processes FEB RAS
Address: 690041, Russia, Vladivostok, Radio St., 5
Phone : +7 (914) 662-36-58. **E-mail**: devyatis@dvo.ru
ORCID: 0000-0002-3593-5397

KONOPLIN Aleksandr Yuryevich, Doctor of Technical Sciences, Director
M.D. Ageev Institute of Marine Technology Problems Far East Branch Russian Academy of Sciences
Address: 690091, Russia, Vladivostok, Sukhanova St., 5a
Phone : +7 (423) 243-24-16. **E-mail**: konoplin@marine.febras.ru

SHURYGIN Artyom Vladimirovich, Junior Researcher
Institute of Automation and Control Processes FEB RAS
Address: 690041, Russia, Vladivostok, Radio St., 5
Phone : +7 (924) 339-18-08. **E-mail**: ashurygin@dvo.ru
ORCID: 0000-0003-2388-8455