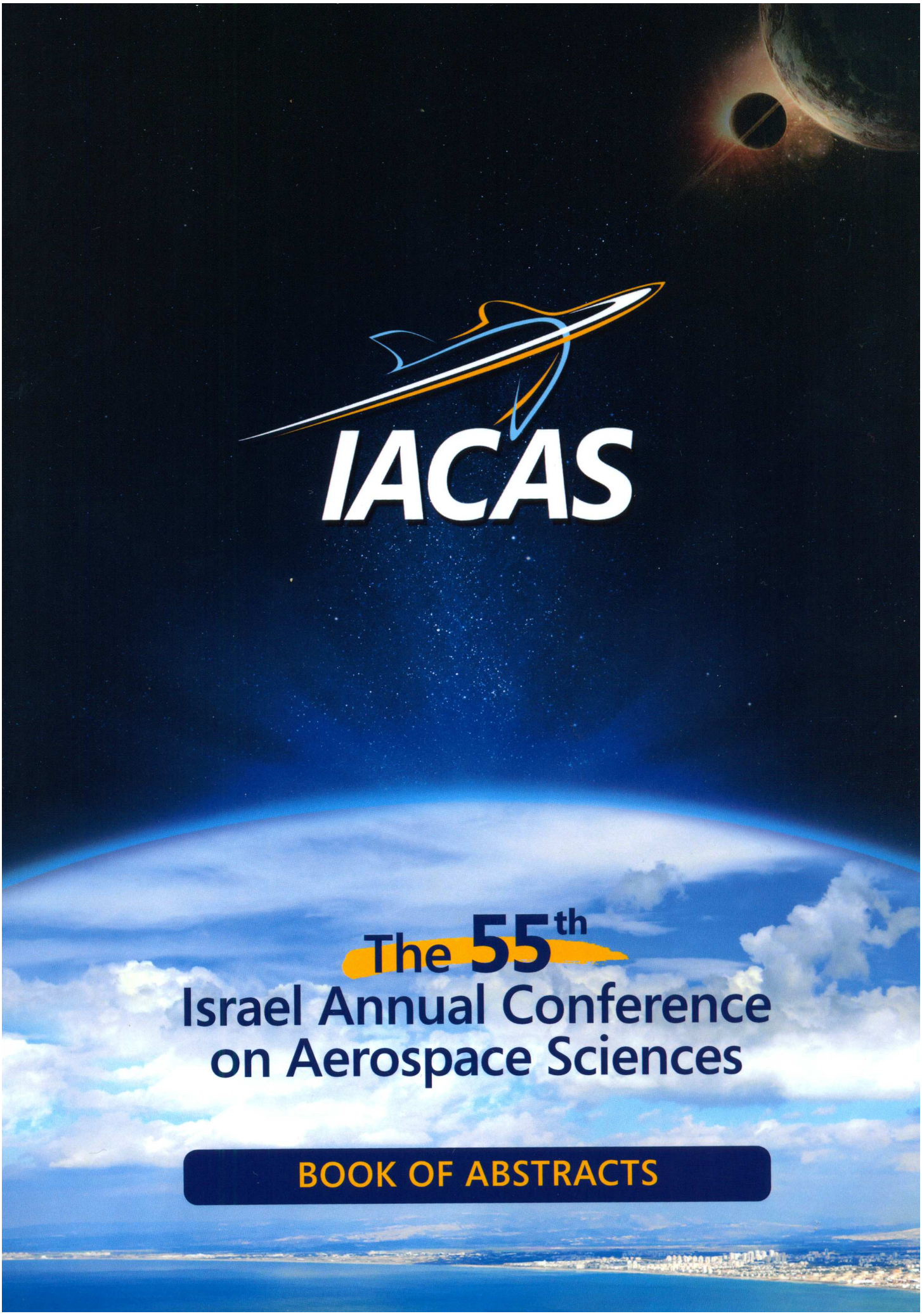
IACAS
The 55th
Israel Annual Conference
on Aerospace Sciences
BOOK OF ABSTRACTS

16:50-17:15 ThL2T3.3

Magnetometers-Based Angular Rates Biases Estimation

Segal, Shai IMI
Boyarski, Shmuel IMI

Consider a strapdown seeker for short-duration missions equipped with a rate gyros (RGs) triad and a magnetometers (Mags) triad, where the angular rates measured by the RGs are biased. This work presents an estimation scheme for these rate-biases which uses the (noisy) Mags measurements; Mags biases will also be addressed. The proposed estimation algorithm does not require any information about the dynamics or inertial properties of the vehicle, and is based solely on Mags and RGs measurements; it uses the fact that the magnetic field is fixed in Earth coordinates. The performance of the proposed estimator is validated by extensive Monte-Carlo simulations (1000 runs). It is shown that RGs biases (in the example: 0.5 [deg/sec], one standard deviation) are fully estimated in less than 20 seconds; moreover, most of the bias is estimated in about 10 seconds, even in the presence of some Mag biases.

17:15-17:40 ThL2T3.4

Coprocession of Data from Several Radars for Determination of Systematic Errors in Azimuth and Range

Bedin, Dmitrii Krasovskii Institute of Mathematics and Mechanics of UrB RAS
Fedotov, Andrey Anatol'evich Krasovskii Institute of Mathematics and Mechanics of UrB RAS
Ivanov, Alexey Gennad'evich Krasovskii Institute of Mathematics and Mechanics of UrB RAS
Patsko, Valery, S. Krasovskii Institute of Mathematics and Mechanics of UrB RAS
Ganebniy, Sergey NITA LLC

The paper describes three approaches for solving the problem of estimation of systematic errors in radar measurements obtained from several overlapping observation domains. In the proposed approaches, neither one of the radars could be considered as a reference one. The systematic errors are determined by the processing of measurements of the radars due to informational redundancy in the radar data. The proposed methods can be used in computational information complexes of the air traffic control systems.

ThL2T4 **Room 240**

Combustion and Propulsion (Regular Session)

Chair: Sher, Eran Technion

16:00-16:25 ThL2T4.1

Theoretical Model of a Burning Porous Particle Containing Liquid Fuel

Mor, Yoash Technion
Gany, Alon Technion

An analytical model describing the burning of a liquid fuel, contained in a porous particle, has been developed. The solution of the problem is based on the following physical principles: mass conservation; species conservation; vapor-liquid equilibrium on the surface of the liquid droplet located at the core of the porous particle, and energy conservation. The explicit solution predicts the main combustion parameters: flame temperature, flame radius, mass flow rate, droplet radius and fuel's mass fraction at the droplet surface. In addition, it describes the temperature and the species mass fraction profiles.

16:25-16:50 ThL2T4.2

Electric Energy Production for Commercial Aircraft Based on Fuel Cells and On-Board Hydrogen Generation

Elitzur, Shani Technion
Rosenband, Valery Technion
Gany, Alon Technion

This paper presents the potential of a novel method for hydrogen generation based on aluminum-water reaction in commercial aircraft applications. The hydrogen produced on-board can be used in a PEM fuel cell to generate green electric energy. The possibility to use the waste water on the aircraft leads to high specific energy of up to 850 Wh/kg. In addition, the aluminum-water reaction enables safe use of hydrogen. A parametric investigation of the reaction between aluminum and a synthetic urine mixture is presented in order to show that the waste water in the aircraft can be used for hydrogen generation, as well as the clean water. High reaction rates of up to 350 ml/min/g Al as well as high yield of about 90% was demonstrated.