XXXI GA
IAU XXXI
Astronomy for All
Busan 2022

XXXIst General Assembly
International Astronomical Union

IAUGA 2022

August 2 (Tue) - 11 (Thu), 2022

BEXCO, Busan, Rep. of Korea

IAU

THE KOREAN
ASTRONOMICAL SOCIETY
한국천문학회

KASI Korea Astronomy and
Space Science Institute

ABSTRACT
BOOK

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WELCOME MESSAGE

On behalf of the IAUGA 2022 National Organizing Committee, it is my greatest honor and privilege to invite you all to the XXXIst International Astronomical Union General Assembly (IAUGA 2022), to be hosted at BEXCO in Busan, Republic of Korea between August 2 and 11, 2022.

Initially, the NOC proposed "Astronomy for all" as the main theme, in a hope to make the Busan GA as inclusive as possible. As the COVID-19 pandemic hit the globe in early 2020, for the first time in the IAU history, the GA 2022 is being organized as a hybrid meeting, which allows both in-person and remote participation. New virtual elements such as remote talks, e-Talks, e-Posters, and an online chatting platform will be introduced to the GA logistics. After more than two years of online meetings, we believe astronomers are eager to meet our colleagues face-to-face. The NOC sincerely hopes that scientific programs will run smoothly for both in-person attendees and remote participants during the GA.

The host city, Busan, is the second largest city in the Republic of Korea, where contemporary lifestyle meets long-standing history with the state-of-the-art facilities and world-class infrastructure. All in-person attendees shall appreciate her rich natural, cultural, and urban legacies; and have a rewarding and productive time in every way in and around the GA.

Please join us for the festival of Astronomy in Busan.

Prof. Hyesung Kang
Chair
IAUGA 2022 National Organizing Committee

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ABSTRACTS

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General Fields

Evolution equations of the multi-planetary problem with variable masses

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The study of dynamical evolution of planetary systems is actual topic in astronomy. Researching of dynamics of exoplanets [1] in the non-stationary stage of its formation gives us the opportunity to determine further evolutionary tracks. The influence of the variability of the masses of celestial bodies is explored on the dynamic evolution of planetary systems, considering that the masses of bodies change isotropically with different velocities. The laws of masses are considered be known and given functions of time. The differential equations of motion of n+1 bodies in the relative coordinate system are given in the works [2-3]. The methods of canonical perturbation theory are used, which developed on the basis of aperiodic motion over a quasi-conical section [2].

The Wolfram Mathematica package is used in the expansion of perturbing functions into series. Secular perturbations of Poincare elements are defined as solutions of a system of 4n linear differential equations. The evolutionary equations are obtained.

The three-planet exosystem K2-3 is considered in the non-stationary stage of its evolution. The secular perturbations of Poincare elements are described as system of 12 linear non-autonomous differential equations. Further, the evolutionary equations are investigated by numerical method.

Bibliography

[1] https://exoplanets.nasa.gov/

[2] Minglibayev M.Zh. Dynamics of gravitating bodies with variable masses and sizes [Dinamika gravitiruyushchikh tel s peremennymi massami i razmerami]. LAP LAMBERT Academic Publishing. –2012. – P.224. Germany.ISBN:978-3-659-29945-2 (in Russ.)

[3] Prokopenya A. N., Minglibayev M. Zh., Kosherbaeva A. B. Derivation of Evolutionary Equations in the Many-Body Problem with Isotropically Varying Masses Using Computer Algebra // Programming and Computer Software. –2022. –V.48(2). –P.107–115. DOI:10.1134/S0361768822020098

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