

## Accepted Manuscript

Out-of-Plane Equilibrium Points and Regions of Motion in  
Photogravitational R3BP when the Primaries are Heterogeneous  
Spheroid with Three Layers

Md Sanam Suraj, Rajiv Aggarwal, Kumari Shalini, Md Chand Asique

PII: S1384-1076(17)30415-3  
DOI: [10.1016/j.newast.2018.02.005](https://doi.org/10.1016/j.newast.2018.02.005)  
Reference: NEASPA 1181



To appear in: *New Astronomy*

Received date: 27 December 2017

Accepted date: 11 February 2018

Please cite this article as: Md Sanam Suraj, Rajiv Aggarwal, Kumari Shalini, Md Chand Asique, Out-of-Plane Equilibrium Points and Regions of Motion in Photogravitational R3BP when the Primaries are Heterogeneous Spheroid with Three Layers, *New Astronomy* (2018), doi: [10.1016/j.newast.2018.02.005](https://doi.org/10.1016/j.newast.2018.02.005)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

New Astronomy manuscript No.  
(will be inserted by the editor)

## Out-of-Plane Equilibrium Points and Regions of Motion in Photogravitational R3BP when the Primaries are Heterogeneous Spheroid with Three Layers

Md Sanam Suraj · Rajiv Aggarwal · Kumari  
Shalini · Md Chand Asique

Received: date / Accepted: date

**Abstract** The present paper deals with the regions of motion and the out-of-plane equilibrium points in the planar restricted three-body problem when both the primaries are heterogeneous oblate spheroids with three layers of different densities and sources of radiation. We have derived the equations of motion and examined the combine effects of radiation and the effect due to the different layers of primaries on the out-of-plane equilibrium points and regions of motion. It is further observed that the energy constant, the radiation parameter and the effect due to the different layers of primaries have substantial impact on the locations of the out-of-plane equilibrium points and on the regions of motion. Furthermore, we have observed that the out-of-plane equilibrium points are unstable for all mass ratios and other parameters, whereas the infinitesimal mass can move freely around the primaries for smaller values of Jacobi constant. But, when we increase the radiation parameter due to either of the primaries, the forbidden regions increase, where the motion is not possible. Moreover, we have discussed the Newton-Raphson basins of attraction to observe the effect of various perturbation on the topology of basins of convergency on configuration plane.

---

Md Sanam Suraj  
Department of Mathematics, Sri Aurobindo College, University of Delhi, Delhi, India  
E-mail: [mdsanamsuraj@gmail.com](mailto:mdsanamsuraj@gmail.com)

Rajiv Aggarwal  
Department of Mathematics, Sri Aurobindo College, University of Delhi, Delhi, India  
E-mail: [rajiv\\_agg1973@yahoo.com](mailto:rajiv_agg1973@yahoo.com)

Kumari Shalini  
Department of Mathematics, Zakir Husain Delhi College, New Delhi, India  
E-mail: [thakurshalini2000@gmail.com](mailto:thakurshalini2000@gmail.com)

Md Chand Asique  
Research Scholar,  
Department of Physics, Tilka Manjhi Bhagalpur University, Bhagalpur, Bihar, India  
E-mail: [mdchandasique@gmail.com](mailto:mdchandasique@gmail.com)

Download English Version:

<https://daneshyari.com/en/article/8141292>

Download Persian Version:

<https://daneshyari.com/article/8141292>

[Daneshyari.com](https://daneshyari.com)