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Trajectories of spacecraft near liberation point of Sun-Earth-Moon system

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The motion of spacecraft near liberation points of Sun-Earth-Moon system is treated as restricted four-body problem. The Sun-Earth-Moon Model is applied and the canonical units of masses and distances are used, dividing all masses by the total mass of the earth-moon and dividing all distances by the distance between earth and moon. The equations of motion for the system are formulated, zero velocity curves deduced and plotted. The liberation points, three collinear points (L1, L2, L3) and two equatorial points (L4, L5) for the system are obtained. An algorithm with MATHEMATICA language is constructed to compute Trajectories and phases space of spacecraft near liberation points are computed by numerical integration with Runge-Kutta method depending on masses ratio and liberation points as initial conditions.

Biography

Ahmed Hafez Ibrahim has completed his MSc degree in Space Dynamics from Al-Azhar University in August 2014. He is an Assistant Lecturer and PhD student at Faculty of Science of Al-Azhar University.

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