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ABSTRACT BOOK

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To the dynamics of the two-body problem with variable masses in the presence of reactive forces

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The dynamics of celestial bodies with variable masses, especially the non-stationary stage of the gravitating system is little studied [1, 2]. We have considered the gravitational system consisting of two spherical celestial bodies with variable masses in the relative coordinate system. We studied the general case where the masses of bodies change non-isotropically at different rates, in the presence of reactive forces.

The problem was investigated by methods of perturbation theory based on aperiodic motion along a quasi-conic section [1-3]. We used perturbed motion equations in the Newton form equations with variables a, e, i, π, Ω, λ, which are analogs of Keplerian elements. The equations of perturbed motion of the osculating variables are obtained.

Averaging over the mean longitude we obtained the evolution equations of the two-body problem with variable masses in the presence of reactive forces. The evolution equations have an exact analytic integral a3e4=const.

The derived evolution equations of the two-body problem with variable masses in the presence of reactive forces will be used to study binary systems with variable masses.

References

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