

On the behaviour of stationar point in quazi-central configuration dynamics

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The system of N massive points m and central mass M , formed central configuration is considered. The equation of motion for testing particle has written in different coordinate system. The comparison of different form of equation of motion in problem is developed. For large N , the equations, correct both for odd and even number of particles are given. It is shown, that the libration points in considered system may be determined from algebraic equation of 5-th degree. The comparison of different ways of solution this equation is given. Main attention is given case of large N . It is obtained, that at large mass of particles outside libration point disappear. For inner libration points the limit distance l exist - libration points cannot be close then l to the central mass M at fixed N and arbitrary m / M ratio. In case small m / M solution for libration points in problem have as a limit similar solution for 3-body collinear points. Then we consider quazi-central configuration - chain of particles at elliptic orbit and obtain stationary distribution of particles in this case. We estimate the rate of eccentricity change under mutual gravitation interaction of ring' s particles. The result is compared with numerical calculations. The inclined ring may be considered by similar way. The modeling of ring, consist of 250 particles is developed by simple Euler scheme (leapfrog integrator). In result, the number of collisions in dependence of particles mass and number and initial conditions is estimated. As a most really application of such system, we may note a planetary rings, where described associations stabilizing all construction, rotating as a solid body.