

Relative equilibria for the 2-body problem in the hyperbolic plane

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I will present the results of our recent paper [3] where we classify and analyze the stability of all relative equilibria for the two-body problem in the hyperbolic space of dimension 2.

This is a continuation of the research program initiated in [1] on the study of the relative equilibria for the n -body problem in spaces of constant curvature. Our contribution is to show that, for the 2-body problem in the hyperbolic plane, the only relative equilibria arise as conjugation of the so-called “elliptic” and “hyperbolic” relative equilibria found before in [2]. Moreover, we show that all of the hyperbolic relative equilibria are unstable and establish necessary and sufficient conditions for nonlinear stability of the elliptic relative equilibria. Such conditions are given in terms of the ratio of the masses and the hyperbolic distance between the particles. All of our results are formulated in terms of the intrinsic Riemannian data of the problem so they are valid in any model of the hyperbolic plane.

References

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