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Symmetry-breaking bifurcations of the Hip-Hop orbit

In this talk, I will present recent results on the classification of symmetry-breaking bifurcations of the reduced Hip-Hop orbit of the 4-body problem obtained by Chenciner and Venturelli (2000). These are obtained by using results of Lamb, Melbourne and Wulff on bifurcations from discrete rotating waves with time-reversing symmetries and by looking at Maslov-type indices of symplectic matrices in $\text{Sp}(4)$. Minimization properties of the bifurcating solutions will also be discussed. Numerical Poincaré maps are also computed and show the sequence of bifurcations as the energy is varied. This is joint work with Mitchell Kovacic (B.Sc, UOIT).