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Braids in the N-body problem

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We prove the existence of periodic solution of the N = n+1-body problem in an even dimensional Euclidean space: We start with n bodies whose reduced motion is close to a central configuration and we replace one of them by a pair of bodies rotating uniformly around their center of mass. When the motion takes place in the standard Euclidean plane these solutions are a special type of braid solution. We use a variational formulation and the result is obtained by performing a Lyapunov-Schmidt reduction and the use of the Lyusternik-Schnirelmann category.

This work is in collaboration with Carlos Garcia-Azpeita.