

CENTRAL CONFIGURATIONS, EQUIVARIANT FIXED POINTS AND MUTUAL DIFFERENCES

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ABSTRACT. Central configurations of n point particles in a euclidean space interacting via a potential function U are shown to be the same as the fixed points of the normalized gradient map, which is an $SO(d)$ -equivariant self-map defined on the inertia ellipsoid, and to critical points of a map defined on a subspace of 1-dimensional simplicial cochains. We then show how to relate Morse-indices of central configurations (as critical points) with their fixed point indices. The approach is then used to give some estimates of the number of central configurations and to relate bifurcations of the energy surfaces in the configuration spaces with topological invariants of the configuration space.

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