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Geometric mechanics and the lump dynamics of the CP^1 sigma model on the sphere.

Usually the potential energy of a simple mechanical system breaks the larger symmetry of its kinetic energy. However, the CP^1 sigma model is a lagrangian field theory of potential plus kinetic type where the potential has the larger symmetry. In this case equilibria are not isolated but rather occur in a nongeneric way on group orbits of the symmetry of the potential, and the dynamics near such equilibria may be approximated by a geodesic flow. Applied to the CP^1 sigma model [J.M. Speight, Low-energy dynamics of a CP^1 lump on the sphere], this yields a finite dimensional simple mechanical system with the additional feature that its configuration space has nontrivial (constant type) isotropy, thereby providing a specific example of the general situation considered in the 1983 technical report [R. Montgomery, The structure of reduced cotangent phase spaces for non-free group actions].