Reducing scattering problems under cone potentials to normal form by global canonical transformations

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(Submitted on 7 Apr 2012)

We introduce a class of Hamiltonian scattering systems which can be reduced to the "normal form" $\dot P=0$, $\dot Q=P$, by means of a global canonical transformation $ (P,Q)=A(p,q), p,q\in R^n$, defined through asymptotic properties of the trajectories.
These systems are obtained requiring certain geometrical conditions on $\dot p=-\nabla V(q)$, $\dot q=p$, where V is a bounded below "cone potential", i.e., the force $-\nabla V(q)$ always belongs to a closed convex cone which contains no straight lines.
We can deal with very different asymptotic behaviours of the potential and the potential can undergo small perturbations in any arbitrary compact set without losing the existence and the properties of A.

Subjects:	**Exactly Solvable and Integrable Systems (nlin.SI)**
MSC classes:	58F05 (Primary) 58F07, 70H05 (Secondary)
Journal reference:	Journal of Differential Equations Volume 88, Issue 1, November 1990, Pages 71-86
Cite as:	**arXiv:1204.1640 [nlin.SI]**
	(or **arXiv:1204.1640v1 [nlin.SI]** for this version)

Submission history

From: Gaetano Zampieri [view email]
[v1] Sat, 7 Apr 2012 14:08:23 GMT (13kb)

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