

Contribution Title: GENERALIZED STACKEL TRANSFORM: INTEGRABILITY AND BEYOND  
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In this work we introduce multiparameter generalized Stäckel transform – a noncanonical transformation of a special kind relating the sets of (not necessarily commuting) Hamiltonians and leaving the phase space coordinates intact.

It is shown that under certain conditions the transformation in question preserves Liouville integrability, noncommutative integrability and superintegrability. For instance, when applied to an  $n$ -tuple of commuting Hamiltonians, this transformation yields a (new)  $n$ -tuple of commuting Hamiltonians.

Thus, one can construct new integrable systems from the old ones and also find new links among known integrable systems using the transformation under study. In particular, we show that integrable systems associated with the so-called  $k$ -hole deformations of the separation curve of Benenti type are related to the ones associated with the original separation curve of Benenti type through an appropriately chosen multiparameter generalized Stäckel transform.

The corresponding transformation for the equations of motion proves to be nothing but a reciprocal transformation of a special form, and we briefly discuss the properties of this class of reciprocal transformations, including applications to hydrodynamic-type systems.

For more details see A. Sergyeyev, M. Blaszak, Generalized Stäckel transform and reciprocal transformations for finite-dimensional integrable systems, *J. Phys. A: Math. Theor.* 41 (2008), 105205.