

Symbolic methods for symmetric variational problems: the $SE(3)$ case

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In the seminal paper “Invariante Variationsprobleme” by Emmy Noether, she showed that for systems derived from a variational principle, the associated conservation laws could be obtained from Lie group actions that left the variational problem unchanged. Recently, we proved that these conservation laws could be rewritten as the divergence of the product of a moving frame and a vector of invariants. The aim of this talk is to illustrate how the knowledge of the conservation laws structure helps reduce the extremising problem, in particular for variational problems that are invariant under the special Euclidean group $SE(3)$.