

VARIATIONAL ORDER FOR FORCED LAGRANGIAN SYSTEMS

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We are able to derive the equations of motion for forced mechanical systems in a purely variational setting, both in the context of Lagrangian or Hamiltonian mechanics, by duplicating the variables of the system. We show that this construction is useful to design high-order integrators for forced Lagrangian systems and, more importantly, we give a characterization of the order of a method applied to a forced system using the corresponding variational order of the duplicated one.