Lepage congruencies in Discrete Mechanics

P. L. García and A. Fernández

Abstract

We introduce the concept of contact 1-form and a corresponding notion of tangency in Discrete Mechanics. We express in terms of this concept the Poincaré–Cartan form of a discrete Lagrangian and its exterior differential by two formulas that generalizes to the Discrete Mechanics the classical Lepage congruencies. The requirement for these congruencies to have similar properties to those in the continuous case leads to a special class of mechanical systems, which interest is illustrated with some examples.