

## A spectral sequence approach to normal forms

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### **Abstract**

Examples of applications of normal forms are to vector fields, Hamiltonians at equilibria, systems of differential equations (Poincaré), singularities (Arnold) and unfolding for local dynamical systems (Murdock). In another context normal forms provide a unique representative for the orbits of the expand action in a graded Lie algebra. The computation of the normal form of a specific element via the “normal form algorithm can be formidable. I will talk about a particularly simple spectral sequence, which systematizes the normal form computation. I will give examples, and talk about applications to an infinite dimensional Lie algebra studied by Guoting Chen and if time allows, to Hamiltonians