

Strong homotopy and differential graded categories associated to topological spaces and simplicial sets

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(joint with J. Chuang and J. Holstein)

The modern formulation of formal deformation theory in characteristic zero is based on the notion of a Maurer-Cartan (MC) element in a differential graded (dg) Lie algebra L ; it is an odd element x satisfying the flat connection equation $dx + 1/2[x, x] = 0$. There is a suitable notion of gauge equivalence and the moduli set of MC elements in dg Lie algebras.

There is an analogous but somewhat less well studied notion of an MC element in a dg associative algebra A and the corresponding MC moduli set. The latter is not a quasi-isomorphism invariant of A , but is an invariant under a finer strong homotopy equivalence relation on dg algebras. I will explain this notion, and how it gives rise to various homotopy invariants and Riemann-Hilbert type theorems. If time permits, I will outline connections with Joyals quasi-categories.