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**Title: On Deformations of Courant pairs and Poisson algebras**

**Abstract:** This work provides a deformation theory for a new type of algebraic structure called Courant pair- a special type of Courant algebra over the Lie algebra of derivations of an associative algebra. One can find that Courant algebras appear in several branches of mathematics. One of the main problems in deformation theory is to describe all non-equivalent deformations of a given object. We solve this problem by defining the required deformation cohomology and systematically develop a method of inductive construction giving a versal deformation of Courant pairs. Since every Leibniz pair is an example of a Courant pair, it is natural to ask for additional deformations for a Poisson algebra or a Leibniz pair by considering it in the larger category of Courant pairs. We answer this question by computing some Poisson algebra examples and find that there is a difference even in the infinitesimal level. We explicitly compute universal infinitesimal deformations of Poisson algebra structures on the three dimensional complex Heisenberg Lie algebra by considering them in both the categories of Leibniz pairs and Courant pairs. More interestingly, a Courant pair can be described as a non skew-symmetric version of Open-closed homotopy algebra and subsequently as an algebra over an operad.