NIJENHUIS DEFORMATION OF GERSTENHABER ALGEBRA AND POISSON QUASI-NIJENHUIS ALGEBROIDS

The importance of Nijenhuis tensor on the Lie algebra of vector fields on a manifold is not only because of the Newlander-Nirenberg theorem, but also it appears in the study of Hamiltonian systems. The notion is known for some geometric structures such as Poisson manifolds, Courant algebroids, Ω_N-structures etc. On the other hand there are L_∞-algebras associated to the mentioned structures. Since L_∞-algebras are a generalization of Lie algebras, it is natural to ask what could be a good generalization of Nijenhuis tensor to the case of L_∞?

In this talk, using a type of Richardson-Nijenhuis bracket on the space of vector valued forms on a graded vector space, we will see that Lie algebras are very particular cases of L_∞-algebras. Then after recalling the notion of Nijenhuis tensor on a Lie algebra, I introduce (a type of) Nijenhuis on L_∞-algebras. I will mention how the notion behaves well with the already existing notions of Nijenhuis on geometric structures. In particular, I will show that a Poisson Quasi-Nijenhuis structure with background is a nothing than a suitable choice of Nijenhuis deformation on some L_∞-algebra.

Nijenhuis deformation of L_∞-algebras enable us to construct new L_∞-algebras. We will see this in the context of Gerstenhaber algebra, seen as L_∞-algebra.