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On the formal Peterson subalgebra and its dual

We discuss a generalization of the Peterson subalgebra to a generalized (oriented) cohomology theory which we call the formal Peterson subalgebra.

One of our results shows that the localized formal Peterson subalgebra for the extended Dynkin diagram of type \hat{A}_1 provides an algebraic model for ‘quantum generalized cohomology’ of the projective line. Hence, confirming and extending the Peterson conjecture for these settings.

We also prove that the dual of the formal Peterson subalgebra (a generalized cohomology of the affine Grassmannian) is the 0th Hochschild homology of the formal affine Demazure algebra. Hence, extending the techniques and results on the Hopf algebroids of structure algebras of moment graphs by [Lanini-Xiong-Z.] to the case of affine root systems.