

1097-81-57

Matilde Marcolli* (matilde@caltech.edu), Math Department, Caltech, 1200 E California Blvd, Pasadena, CA 91125, and **Xiang Ni** (xni@caltech.edu), Math Department, Caltech, 1200 E California Blvd, Pasadena, CA 91125. *Rota-Baxter algebras of singular hypersurfaces and applications to quantum field theory*. Preliminary report.

Extending earlier results of Ceyhan and the first author, we construct Rota-Baxter algebras associated to singular hypersurfaces using differential forms with logarithmic poles. We adapt the general formalism of algebraic renormalization, based on Hopf algebras and Rota-Baxter algebras to this setting and we apply it to the case of Feynman integrals in momentum space, reformulated in terms of determinant hypersurfaces as in previous work of Aluffi and the first author. We show that one can obtain a new type of regularization of Feynman integrals, different from the usual methods adopted in physics, which also has different properties with respect to the nature of the resulting periods. (Received January 07, 2014)