1037-16-225   **Miodrag C Iovanov*** (`yovanov@gmail.com`), 107 Springville Ave #1, Buffalo, NY 14226.
Abstract integrals in algebra. Preliminary report.

It is well known that the integrals of Hopf algebras generalize the Haar integral on (locally) compact groups, and the existence and uniqueness theorems for integrals of co-Frobenius Hopf algebras generalize those from the case of topological groups. We start with the observation that for the Hopf algebra of representative functions on compact groups, the coalgebra structure is the one essentially encapsulating the properties of the group, and not the algebra. This, together with the fact that the integral of a Hopf algebra H is just a morphism of comodules from H to the basefield viewed as a comodule in the canonical way, allows the generalization of the concept in a purely co-algebraic setting, and motivates the introduction of generalized integrals for coalgebras.

Perhaps surprisingly, we show that the results from Hopf algebras can be generalized for coalgebras; namely, we show that for a left co-Frobenius coalgebra, the left integrals still have the uniqueness property and the right integrals have the existence property. Moreover, existence and uniqueness of left integrals (or of right integrals) characterizes the property of being a co-Frobenius coalgebra. We also give some interesting interpretations for these generalized integrals in the case of compact groups. (Received February 03, 2008)