

1112-05-632 **Samantha Dahlberg*** (dahlbe14@msu.edu). *A Hopf Algebra on Involutions*. Preliminary report. Let \mathcal{I}_n be the set of involutions inside the symmetric group on $\{1, \dots, n\}$. In this talk we will define a Hopf algebra on $I = \bigoplus_{n \geq 0} \mathbb{F}[\mathcal{I}_n]$ where \mathbb{F} is a field. We find that this Hopf algebra is a sub-Hopf algebra of $NCSym$ the symmetric functions with non-commuting variables. We have a cancellation-free formula for the antipode of $NCSym$ which is derived using Takeuchi's formula and a sign-reversing involution. This is a technique which has recently been introduced by Benedetti and Sagan. This formula in turn gives us an antipode formula for I . (Received August 11, 2015)