1171-05-119   **Kevin Marshall*** (`kmarsh729@ku.edu`), Department of Mathematics, 405 Snow Hall, Lawrence, KS 66045-7594. *A Hopf Monoid on Set Families.* Preliminary report.

We study a Hopf monoid **SetFam** whose underlying objects are arbitrary set families, with product given by join and coproduct defined by a general notion of restriction and contraction, analogous to that for matroids. Of particular interest is the Hopf submonoid **LOI** spanned by families $J(P)$ of order ideals of finite posets P. We summarize a topological approach, inspired by the work of Aguiar and Ardila on generalized permutahedra, for a cancellation-free formula for the antipode in **LOI**. We then look at the Hopf submonoid **Simp** spanned by simplicial complexes where we have some results in finding a cancellation-free formula. (Received August 09, 2021)