

HOPF MONOIDS RELATIVE TO A HYPERPLANE ARRANGEMENT

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Abstract: The talk is based on recent and ongoing work with Swapneel Mahajan. We will introduce a notion of Hopf monoid relative to a real hyperplane arrangement. When the latter is the braid arrangement, the notion is closely related to that of a Hopf monoid in Joyal's category of species, and to the classical notion of connected graded Hopf algebra. We are able to extend many concepts and results from the classical theory of connected Hopf algebras to this level. The extended theory connects to the representation theory of a certain finite dimensional algebra, the Tits algebra of the arrangement. This perspective on Hopf theory is novel even when applied to the classical case. We will outline our approach to generalizations of the classical Leray-Samelson, Borel-Hopf, and Cartier-Milnor-Moore theorems to this setting. Background on hyperplane arrangements will be reviewed.