Species on hyperplane arrangements

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Abstract. We will discuss a notion of *hyperspecies* in which the role of finite sets is played by finite real hyperplane arrangements. Joyal's species arise from the braid arrangements. Our goal is to study a notion of *hyperbimonoids* and *Hopf hypermonoids*. These are hyperspecies carrying a structure akin to that of a Hopf algebra.

Geometric considerations allow us to define a monad and a comonad on the category of hyperspecies, linked by a mixed distributive law in the sense of Beck. Hyperbimonoids are the corresponding bialgebras. The key ingredient in this construction is furnished by the projection maps of Tits. We will discuss these geometric aspects without assuming familiarity with hyperplane arrangements.

Time permitting we will also introduce a corresponding notion of *hyperoperad*.

This is joint work in progress with Swapneel Mahajan.

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