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**Shirley Elizabeth Law\*** ([selaw@ncsu.edu](mailto:selaw@ncsu.edu)). *The Hopf Algebra of Sashes.*

A general lattice theoretic construction of Reading constructs Hopf subalgebras of the Malvenuto-Reutenauer Hopf algebra (MR) of permutations. The products and coproducts in these Hopf subalgebras are defined extrinsically in terms of the embedding in MR. The goal of this research is to find an intrinsic combinatorial description of a particular family of these Hopf subalgebras. The simplest Hopf algebra in the family has a natural basis given by permutations that I call Pell permutations. The Pell permutations are in bijection with combinatorial objects that I call sashes; that is, tilings of a 1 by  $n$  rectangle with three types of tiles: black 1 by 1 squares, white 1 by 1 squares, and white 1 by 2 rectangles. The bijection induces a Hopf algebra structure on sashes. I will describe the product and coproduct in terms of sashes, and the natural partial order on sashes. I also will discuss how the Hopf subalgebra relates to the larger family of Hopf subalgebras. (Received September 07, 2012)