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The properties of four partial orders on standard Young tableaux

Standard Young tableaux have been well knowm with their connection with the representation theory of symmetric group and special linear algebra sl_n. In this talk we will focus on the following four partial orders which are induced from this connection: weak, KL, geometric and chain orders.

After recalling their definitions and some of their crucial properties, we will discuss three main results about these orders. The first one is related to the product in a Hopf algebra of tableaux defined by Poirier and Reutenauer. The second one is about the homotopy type of their proper parts. The last one addresses two of these orders which can be defined on the skew tableaux having fixed inner boundary, and similarly analyzes their homotopy type and Möbius function.

The talk will further include some preliminary results about domino tableaux, which are also related to the representation theory of symplectic algebra sp_{2n} and orthogonal algebra so_{2n+1}.