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On the von Neumann algebras associated to quantum permutation groups.

In 1998, Shuzhou Wang showed that the permutation group S_N (acting on the finite set $X_N = \{1, 2, \ldots, N\}$) admits a natural analogue within the category of *quantum* transformation groups acting on X_N. The resulting compact quantum group is denoted by S_N^+, and is called the quantum permutation group.

In this talk, we will study the reduced von Neumann algebra $L^\infty(S_N^+)$ associated to the quantum group S_N^+. Unlike the situation for S_N (where of course $L^\infty(S_N) = C(S_N) \cong \mathbb{C}^{N!}$), $L^\infty(S_N^+)$ turns out to be a non-injective finite von Neumann algebra as soon as $N \geq 5$. We prove that $L^\infty(S_N^+)$ always has the Haagerup property and is a full type II_1-factor when $N \geq 8$.