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Comparing skew Schur functions: a quasisymmetric perspective

This story begins with work of Reiner, Shaw and van Willigenburg, where they showed that if two skew Schur functions s_A and s_B are equal, then the skew shapes A and B must have the same "row overlap partitions." Unfortunately, the converse is not true. Recently, we have shown that these row overlap equalities are also implied by a much weaker condition than skew Schur equality: that s_A and s_B have the same support when expanded in the fundamental quasisymmetric basis F. Surprisingly, there is significant evidence supporting a conjecture that the converse is also true.

In fact, we will work in terms of inequalities: if the F-support of s_A contains that of s_B, then the row overlap partitions of A are dominated by those of B. Again, we conjecture that the converse also holds. After giving evidence in favor of our conjecture, we will conclude with a consideration of how the quasisymmetric Schur basis and the dual immaculate basis fit into our framework.