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Hook-length formulas for skew shapes

In 2014, Naruse announced a formula for skew shapes as a positive sum of products of hook-lengths using "excited diagrams" coming from Schubert calculus. We will show several combinatorial and algebraic proofs of this formula. Multivariate versions of the hook formula lead also to exact product formulas for certain skew SYTs and evaluations of Schubert polynomials. They are directly related to lozenge tilings with multivariate weights, which also appear to have interesting behavior in the limit. Joint work with A. Morales and I. Pak.