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Stephen C. Milne* (milne@math.ohio-state.edu), Department of Mathematics, The Ohio State University, 231 West 18-th Avenue, Columbus, OH 43210-1174. *C_ℓ mock theta functions and “positivity” conjectures.* Preliminary report.

We use the techniques of Andrews’ (1986) along with the C_ℓ Bailey Lemma established by Milne and Lilly (1992) to derive the corresponding multivariable extension of a transformation of Watson for one of the classical third order mock theta functions of Ramanujan. This yields the definition of our C_ℓ mock theta function in the setting of multivariable basic symplectic hypergeometric series associated to root systems. Motivated by Milne’s recent sums of squares work, we then establish explicit general formulas for this new multivariable mock theta function in terms of Schur symmetric functions, Littlewood-Richardson coefficients, and Hall-Littlewood vertex operators. A Schur function “positivity” conjecture analogous to theorems for Macdonald polynomials also arises from some of our computed examples. All of this work provides more combinatorial insight into the classical mock theta functions of Ramanujan. This is joint work with Jon W. Breitenbucher. (Received February 22, 2007)