1086-11-1518   **Frank Garvan** and **Jie L Liang*** (`jieliang@ufl.edu`). *Automatic Proof of Theta-Function Identities.* Preliminary report.

We present a MAPLE package that utilizes the valence formula for proving theta-function identities for generalized eta-products. By rewriting a supposed theta-function identity as a sum of generalized eta-products, we use MAPLE to: (1) check that each term in the sum is indeed a generalized eta-product on $\Gamma_1(N)$ using a result of Robins; (2) find a set of inequivalent cusps for $\Gamma_1(N)$ and the fan width of each cusp; (3) calculate the invariant order of each generalized eta-product in the sum at each cusp of $\Gamma_1(N)$; and (4) apply the valence formula to determine a lower bound for the number of terms to check in the q-expansion of the identity. We prove some new identities. (Received September 24, 2012)

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