

1018-11-152

**Hamza Yesilyurt\*** ([hamza@math.ufl.edu](mailto:hamza@math.ufl.edu)), University of Florida, Department of Mathematics, 358 Little Hall, Gainesville, FL 32611. *New identities for 7-cores with prescribed BG-rank*. Preliminary report.

A  $q$ -series with nonnegative power series coefficients is called positive. The partition statistics BG-rank is defined as an alternating sum of parities of parts of a partition. It is known that the generating function for the number of partitions of  $n$  that are 7-cores with given BG-rank can be written as certain sum of multi-theta functions. We give explicit representations for these generating functions in terms of sums of positive eta-quotients and derive inequalities for their coefficients. New identities for the generating function of unrestricted 7-cores and inequalities for their coefficients are also obtained. Our proofs utilize Ramanujan's theory of modular equations. This is a joint work with Alexander Berkovich. (Received March 03, 2006)