Acadia Larsen* (acadia.larsen01@utrgv.edu). A Generalization of Partition Identities for First Differences of Partitions of $n$ Into at most $m$ Parts.

We show for a prime power number of parts $m$ that the first differences of partitions into at most $m$ parts can be expressed as a non-negative linear combination of partitions into at most $m - 1$ parts. To show this relationship, we combine a quasipolynomial construction of $p(n, m)$ with a new partition identity for a finite number of parts. We prove these results by providing combinatorial interpretations of the quasipolynomial of $p(n, m)$ and the new partition identity. We extend these results by establishing conditions for when partitions of $n$ with parts coming from a finite set $A$ can be expressed as a non-negative linear combination of partitions with parts coming from a finite set $B$. (Received September 04, 2018)