Integer partitions which are simultaneously $t$-cores for distinct values of $t$ have attracted significant interest in recent years. When $s$ and $t$ are relatively prime, Olsson and Stanton have determined the size of the maximal $(s,t)$-core $\kappa_{s,t}$. When $k \geq 2$, a conjecture of Amdeberhan on the maximal $(2k - 1, 2k, 2k + 1)$-core $\kappa_{2k-1,2k,2k+1}$ has also recently been verified by numerous authors.

In this work, we analyze the relationship between maximal $(2k - 1, 2k + 1)$-cores and maximal $(2k - 1, 2k, 2k + 1)$-cores. In previous work, Nath noted that, for all $k \geq 1$,

$$|\kappa_{2k-1,2k+1}| = 4|\kappa_{2k-1,2k,2k+1}|$$

and requested a combinatorial interpretation of this unexpected identity. Here, using the theory of abaci, partition dissection, and elementary results relating triangular numbers and squares, we provide such a combinatorial proof. This is joint work with Rishi Nath. (Received September 09, 2016)