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Byungchan Kim* (bkim4@illinois.edu), 1409 W. Green St, Urbana, IL 61801, and **Jeremy Rouse** (jarouse@math.uiuc.edu), 1409 W. Green St., Urbana, IL 61801. *Explicit bounds for the number of p -core partitions.*

Let p be a prime number. The generating function for the number of p -core partitions of n is

$$\sum_{n=0}^{\infty} pc_p(n)q^n = \prod_{n=1}^{\infty} \frac{(1 - q^{pn})^p}{1 - q^n}.$$

We use the theory of modular forms, and the circle method of Hardy and Ramanujan to derive explicit bounds on $pc_p(n)$. As an application, we show Stanton's conjecture is true for small p 's. (Received October 04, 2009)