1077-11-405 **Jonathan P Sorenson*** (sorenson@butler.edu), Indianapolis, IN. *Algorithms for Approximately Counting Semismooth Integers.* Preliminary report.

Define the function $\Psi(x, y, z)$ to be the number of integers $n \leq x$ where $n = mp$, m is y-smooth (that is, all prime divisors of m are $\leq y$) and p is prime with $p \leq z$. We loosely define integers counted by $\Psi(x, y, z)$ as *semismooth.* Such integers arise in many integer factoring algorithms with a "large prime" variant, such as the number field sieve.

We look at several algorithms for approximating the value of $\Psi(x, y, z)$ and compare their estimates with exact values of this function for x up to 2^{40}. In particular, we show that for most ranges of x, y, and z, the method of Bach and Peralta (the natural generalization of the Dickman ρ function) is inferior to a method based on numeric integration combined with the fast saddlepoint-based estimate of Suzuki. We also look at several hybrid algorithms. (Received August 29, 2011)