

1125-11-1514

Junxian Li* (jli1135@illinois.edu), **Kyle Pratt** and **George Shakan**. *Heuristic and improvement on the least prime in an arithmetic progression.*

Fix k a positive integer, and let ℓ be coprime to k . Let $p(k, \ell)$ denote the smallest prime equivalent to $\ell \pmod{k}$, and set $P(k) = \max_{(\ell, k)=1} p(k, \ell)$. Assuming some weak dependence between primes, we give a heuristic for some statistics of $P(k)$. Applying modified sieve weights of Maynard and Tao on large gaps between primes, we improve a lower bound for the least prime in an arithmetic progression by Pomerance. In particular, we show that for almost every k one has $P(k) \gg \phi(k) \log k \log_2 k \log_4 k / \log_3 k$, answering a question of Ford, Green, Konyagin, Maynard, and Tao. (Received September 20, 2016)