THE DISTRIBUTION OF SMALL GAPS BETWEEN SUCCESSIVE PRIMES

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Abstract

For $r \geq 1$ and large N, a well-known conjecture of Hardy and Littlewood implies that the number of primes $p \leq N$ such that $p + 2r$ is the least prime greater than p is asymptotic to

$$\int_2^N \left(\sum_{k=1}^{r} \frac{A_{r,k}}{(\log x)^{k+1}} \right) \, dx \; ,$$

where the $A_{r,k}$ are certain constants. We describe a method for computing these constants. Related constants are given to 10D for $r = 1(1)40$, and some empirical evidence supporting the conjecture is mentioned.

Comments

Only the Abstract is given here. A preliminary version appeared as [1] and the full paper appeared as [2]. Related tables [3] were deposited in the *Mathematics of Computation* UMT file.

References

[1] R. P. Brent, "Empirical evidence for a proposed distribution of small prime gaps", Report TR CS 123, Department of Computer Science, Stanford University, February 1969, 18 pp.

[2] R. P. Brent, "The distribution of small gaps between successive primes", *Mathematics of Computation* 28 (1974), 315–324. MR 48#8356, Zbl 274.10001. rpb021

[3] R. P. Brent, "The distribution of prime gaps in intervals up to 10^{16}", UMT 7, *Mathematics of Computation* 28 (1974), 331–332 (reviewed by Daniel Shanks). rpb021r.

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1991 *Mathematics Subject Classification.* Primary 10-04, 10A20, 10A25, 10A40, 65A05.

Key words and phrases. Prime, distribution of primes, Hardy-Littlewood conjecture, prime gap, twin primes.

rpb021a typeset using $\mathcal{A}\mathcal{M}\mathcal{S}$-LaTeX.