

Abstract of paper [1].

We prove the estimate $J(x, h) := o(xh^2(\log x)^{-2})$ for the Selberg integral

$$J(x, h) := \int_x^{2x} \left| \pi(t) - \pi(t - h) - \frac{h}{\log t} \right|^2 dt,$$

when $h \geq x^{1/6 - \varepsilon(x)}$, provided that $\varepsilon(x) \rightarrow 0$ as $x \rightarrow +\infty$. The proof depends on an identity of Linnik and Heath-Brown which yields a suitable Dirichlet series decomposition for the quantity that we want to estimate. This is in a form that can be attacked by means of mean value theorems for Dirichlet series.

References

- [1] A. Zaccagnini. Primes in almost all short intervals. *Acta Arithmetica*, 84:225–244, 1998.