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New Bounds for $\psi(x;q,a)$

Let a, q be relatively prime integers. Then consider

$$\psi(x;q,a) = \sum_{\substack{n\leq x \\ n\equiv a \pmod q}} \Lambda(n).$$

We discuss new explicit bounds for $\psi(x;q,a)$, which provide an extension and improvement over the bounds given in the previous work of Ramaré and Rumely. This article introduces two new ideas. We smooth the prime counting function and use the partial verification of GRH by Platt along with an explicit zero-free region given by Kadiri.

This is joint work with Habiba Kadiri.