1135-11-1321 **Hugh L. Montgomery*** (hlm@umich.edu), Department of Mathematics, University of Michigan, 530 Church Street, Ann Arbor, MI 48109-1043. *New Trigonometric Extremal Problems Related to Pair Correlations.* Preliminary report.

Assume the Riemann Hypothesis (RH), and for real α and $T \geq 2$, put

$$F(\alpha, T) = \Big(\frac{T}{2\pi}\log T\Big)^{-1} \sum_{\substack{0<\gamma\leq T \\ 0<\gamma'\leq T}} T^{i\alpha(\gamma-\gamma')} w(\gamma-\gamma')$$

where $w(u) = 4/(4+u^2)$. We know that F is real valued, even, nonnegative, and that

$$F(\alpha) = (1+o(1))T^{-2\alpha}\log T + \alpha + o(1)$$

uniformly for $0 \leq \alpha \leq 1$. If $R \in L^1(\mathbb{R})$, then

$$\sum_{\substack{0<\gamma\leq T \\ 0<\gamma'\leq T}} \widehat{R}\Big(\frac{\gamma-\gamma'}{2\pi}\log T\Big) w(\gamma-\gamma') = \Big(\frac{T}{2\pi}\log T\Big) \int_{\mathbb{R}} R(\alpha)F(\alpha)\, d\alpha.$$

This has been used to obtain results concerning the spacing of the zeta zeros. In the past it was required that $R(\alpha) = 0$ when $|\alpha| > 1$. We note that this is overly severe: For many purposes it suffices to constrain the sign of R in this range. (Received September 21, 2017)