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**Large Gaps Between Zeros of the Zeta-Function
on the Critical Line and Moment Conjectures
from Random Matrix Theory**

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Abstract. Denote by γ_n the positive ordinates of the non-trivial zeros of the zeta-function in ascending order. Assuming the Riemann hypothesis and conjectural asymptotic formulae for the (continuous and discrete) $2k$ th and $4k$ th moment for the zeta-function originating from random matrix theory, we prove that for any fixed positive integer r more than $cN(T)(\log T)^{-4k^2}$ of the ordinates $\gamma_n \in [0, T]$ satisfy

$$(\gamma_{n+r} - \gamma_n) \frac{\log \gamma_n}{2\pi r} \geq \theta \quad \text{for any } \theta \leq \frac{4k}{\pi e r},$$

where c is a computable positive constant depending on k , θ and r .

Keywords. Riemann zeta-function, nontrivial zeros, Riemann hypothesis, pair correlation, spacing between consecutive zeros, random matrix theory.

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