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The distribution of the zeros of $\zeta(s)$, of $\zeta'(s)$ and the non-existence of Siegel zeros

Denote by $\zeta$ the Riemann zeta-function. All the non-trivial zeros of $\zeta'$ lie to the right of the half-line if and only if the Riemann Hypothesis is true. Assuming the Riemann Hypothesis, the finer distribution of the zeros of $\zeta'$ is not chaotic and seems to depend, on average, on spacings between the consecutive zeros of $\zeta$. We establish a conjecture of Farmer and Ki asserting this finer relation. Farmer and Ki’s conjecture is interesting because of its relevance to the class number problem, and the non-existence of Siegel zeros. Time permitting we will also discuss some recent related probabilistic results.