

# The distribution of the Riemann zeta function in the critical strip

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Abstract: In joint work with Steve Lester and Maksym Radziwill, we investigate the extent to which the distribution of values of the Riemann zeta function  $\zeta(s)$  can be approximated by that of a random Euler product in the strip  $1/2 < \operatorname{Re}(s) \leq 1$ . As an application, we obtain the first effective error term for the number of  $a$ -points of  $\zeta(s)$  (defined as the roots of  $\zeta(s) = a$ ) in a strip  $1/2 < \sigma_1 < \sigma_2 < 1$ . We also study the joint distribution of shifts of  $\zeta(s)$  and use it to improve Voronin's Universality Theorem for the zeta function.

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