ZEROS OF THE RIEMANN ZETA-FUNCTION AND OF ITS DERIVATIVE

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Abstract: N. Levinson and H. L. Montgomery proved that the Riemann zeta-function $\zeta(s)$ and its derivative have approximately the same number of non-real zeros left of the critical line. R. Spira obtained that $\zeta'(1/2+it)=0$ implies $\zeta(1/2+it)=0$. Here we demonstrate that in small areas located to the left of the critical line and near it the functions $\zeta(s)$ and $\zeta'(s)$ have the same number of zeros. We show that our result is true for more general zeta-functions from the extended Selberg class $S^\sharp$. We also consider zero trajectories of a certain family of zeta-functions from $S^\sharp$.

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