

1125-34-208

Ian W. Knowles* (iknowles@uab.edu), Department of Mathematics, University of Alabama at Birmingham, Birmingham, AL 35294. *An inverse problem for the zeta function and the Cramer prime gap conjecture*. Preliminary report.

It is known that the location of the zeros of the Riemann zeta function directly encodes distribution properties of the prime numbers. We show how to inversely create a Sturm-Liouville equation with the property that the location of the zeros of the zeta function directly relates to asymptotic properties of solutions of the differential equation. This connection is then used to investigate an old conjecture of Cramer that, if p_n denotes the n -th prime, then $p_{n+1} - p_n = O((\log p_n)^2)$. (Received September 12, 2016)