

EQUIDISTRIBUTION OF THE STERN SEQUENCE

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ABSTRACT: The Stern sequence b_n had been defined by Stern in 1858 by the formulas: $b_0 = 0$, $b_1 = 1$, $b(2n) = b_n$, $b(2n + 1) = b_n + b(n + 1)$. Let p be a prime and $A_{p,r}(m)$ be the number of indices $n \leq m$ such that $b_n = rb(n + 1) \pmod{p}$. The following theorems hold.

Theorem 1. *For $r = 0, 1, \dots, p - 1$ we have $\lim A_{p,r}(2^n)/2^n = 1/(p + 1)$.*

Conjecture. *For every prime p and every residue $r \pmod{p}$ we have $\lim A_{p,r}(m)/m = 1/(p + 1)$.*

Theorem 2. *Conjecture holds for all primes $p < 10$.*