

Consider the doubling map on the circle $T(x) = 2x(\text{mod } 1)$ and let $\{f_\omega\}$ be a family of piecewise linear test functions. We show that for each $\{f_\omega\}$ there is a unique measure that maximizes $\int f_\omega d\mu$, and this measure is Sturmian. Let ϱ be the rotation number associated with a maximizing orbit then the map $\varrho(\omega)$ is a devil's staircase.