1176-28-173 **Emmanuel Lesigne**, **Anthony Quas**, **Joseph Rosenblatt** and **Máté Wierdl*** (mwierdl@memphis.edu), University of Memphis, 373 Dunn Hall, Memphis, TN 38152. *Generation of measures by statistics of rotations along sets of integers.*

Let $S = (s_1 < s_2 < \dots)$ be a strictly increasing sequence of positive integers and denote $e(\beta) = e^{2\pi i\beta}$. We say S is *good* if for every real α the sequence $\left(\frac{1}{N}\sum_{n\le N} e(s_n\alpha)\right)_{N\in\mathbb{N}}$ of complex numbers is convergent. Equivalently, the sequence S is good if for every real α the sequence $\left(\frac{1}{N}\sum_{n\le N} \delta_{s_n\alpha}\right)_{N\in mathbbN}$ of atomic measures on the torus is convergent in the weak topology of Borel probability measures on the torus. We are interested in finding out what the limit measure $\mu_{S,\alpha} = \lim_N \frac{1}{N}\sum_{n\le N} \delta_{s_n\alpha}$ can be. In this first paper on the subject, we investigate the case of a single irrational α. We show that if S is a good set then for every irrational α the limit measure $\mu_{S,\alpha}$ must be a continuous Borel probability measure. Using random methods, we show that the limit measure $\mu_{S,\alpha}$ can be any measure which is absolutely continuous with respect to the Haar-Lebesgue probability measure on the torus. (Received January 21, 2022)