We consider homogeneous self-similar iterated function systems (IFS) $f_j(x) = Ax + a_j$, for $j = 0, \dots, m$, with A a contracting linear similarity (an orthogonal matrix times $0 < \lambda < 1$) in $\mathbb{R}^d$. Given a probability vector, there exists a unique invariant Borel probability measure for the IFS, which is called a self-similar measure. In the special case $d = 1$ and $m = 1$, i.e., a homogeneous linear IFS of two functions, this measure is known as an "infinite Bernoulli convolution". The properties of such measures have been extensively studied, but many questions remain open. Under some assumptions, we show, using a variant of what is known as Erdős-Kahane method, that "almost all" homogeneous self-similar measures in dimensions greater or equal to 3 have a power Fourier decay. Combined with recent results of Corso and Shmerkin [preprint 2024], this yields some "almost sure" results on absolute continuity of the measure. This is work in progress.

In dimensions 1 and 2 this was known earlier. We will survey the background and known results in this direction in the introductory part of the talk.