1163-28-1611 **Timothy I Myers*** (timyers@howard.edu), 110 Camrose Avenue, Baltimore, MD 21225. *A Constructive Definition of the Fourier Transform on a Separable Banach Space.*

Gill and Myers proved that every separable Banach space, denoted $\mathcal{B}$, has an isomorphic, isometric embedding in $\mathbb{R}^\infty = \mathbb{R} \times \mathbb{R} \times \cdots$. They used this result and a method due to Yamasaki to construct a sigma-finite Lebesgue measure $\lambda_\mathcal{B}$ for $\mathcal{B}$ and defined the associated integral $\int_\mathcal{B} \cdot \, d\lambda_\mathcal{B}$ in a way that equals a limit of finite-dimensional Lebesgue integrals.

The objective of this talk is to apply this theory to developing a constructive definition of the Fourier transform on $L^1[\mathcal{B}]$. Our approach is constructive in the sense that this Fourier transform is defined as an integral on $\mathcal{B}$, which, by the aforementioned definition, equals a limit of Lebesgue integrals on Euclidean space as the dimension $n \to \infty$. Thus with this theory we may evaluate infinite-dimensional quantities, such as the Fourier transform on $\mathcal{B}$, by means of finite-dimensional approximation. (Received September 15, 2020)