1089-46-260 **Dorin Ervin Dutkay** and **John Haussermann*** (jhaussermann@knights.ucf.edu). *Tiling Properties of Spectra of Measures.*

We investigate tiling properties of spectra of measures, i.e., sets $\Lambda$ in $\mathbb{R}$ such that $\{e^{2\pi i\lambda x} : \lambda \in \Lambda\}$ forms an orthogonal basis in $L^2(\mu)$, where $\mu$ is some finite Borel measure on $\mathbb{R}$. Such measures include Lebesgue measure on bounded Borel subsets, finite atomic measures and some fractal Hausdorff measures. We show that various classes of such spectra of measures have translational tiling properties. This lead to some surprizing tiling properties for spectra of fractal measures, the existence of complementing sets and spectra for finite sets with the Coven-Meyerowitz property, the existence of complementing Hadamard pairs in the case of Hadamard pairs of size 2,3,4 or 5. In the context of the Fuglede conjecture, we prove that any spectral set is a tile, if the period of the spectrum is 2,3,4 or 5. (Received February 17, 2013)