1127-47-102 **Karl-Mikael Perfekt*** (`kperfekt@utk.edu`) and **Alexander Pushnitski**. *Helson matrices: Boundedness, moment problems, and finite rank.*

A Helson matrix (also known as a multiplicative Hankel matrix), is an infinite matrix of the form $M(\alpha) = \{\alpha(nm)\}_{n,m=1}^{\infty}$, where α is a sequence of complex numbers. As linear operators on $\ell^2(\mathbb{N})$, Helson matrices generalize Hankel matrices $\{\beta(j+k)\}_{j,k=0}^{\infty}$.

Helson initiated the study of their boundedness, but the theory has not yielded a characterization. However, when a Helson matrix is positive semidefinite it may be realized as the moment sequence of a measure μ on $\mathbb{R}^\infty$, assuming that α does not grow too fast. This gives a description of the bounded non-negative Helson matrices in terms of Carleson measures for the Hardy space of countably many variables.

We have also completely determined the spectrum of the model example of a Helson matrix: the multiplicative Hilbert matrix. Furthermore, we characterized the Helson matrices of finite rank, giving an analogue of Kronecker's theorem in this context. (Received January 26, 2017)