1019-11-105 **Andreas Weingartner*** (weingartner@suu.edu), Department of Mathematics, Southern Utah University, Cedar City, UT 84720. *An equivalence for the Riemann hypothesis in terms of coefficients of orthogonal projections.*

Consider the Hilbert space H of sequences of complex numbers with inner product $\langle x, y\rangle = \sum_{j=1}^{\infty} \frac{x(j)\,\overline{y(j)}}{j\,(j+1)}$. Define $r_k \in H$ to be the sequence whose j-th term $r_k(j)$ is the remainder when j is divided by k. A strong version of the Nyman-Beurling criterion, due to Baez-Duarte, states that the Riemann hypothesis is equivalent to the assertion that $(1, 1, 1, \ldots)$ can be approximated in H with arbitrary precision by finite linear combinations of $\{r_k\}_{k\geq 2}$. Let $\sum_{k=2}^{n} c_{n,k}\, r_k$ be the orthogonal projection of $(1, 1, 1, \ldots)$ onto the subspace of H spanned by $\{r_2, r_3, \ldots, r_n\}$. We show that the Riemann hypothesis is equivalent to the statement $\lim_{n\to\infty} c_{n,k} = -\frac{\mu(k)}{k}$ for all $k \geq 2$. (Received August 09, 2006)