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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 $(1, 1, 1, \dots)$ 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 $(1, 1, 1, \dots)$ onto the subspace of H spanned by $\{r_2, r_3, \dots, r_n\}$. We show that the Riemann hypothesis is equivalent to the statement $\lim_{n \rightarrow \infty} c_{n,k} = -\frac{\mu(k)}{k}$ for all $k \geq 2$. (Received August 09, 2006)