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8. Analysis

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Nonuniqueness for smooth uniformly bounded orthonormal systems

An orthonormal on the interval $[0,1]$ system of functions $\varphi_n(x)$ will be said to have the *nonuniqueness property* if there are constants c_n, not all zero, such that $\sum c_n\varphi_n(x) = 0$ for every $x \in [0,1]$. A uniformly bounded orthonormal system of continuous functions with the nonuniqueness property was discovered by G. M. Mu\v segian and R. I. Ovsepjan. {*The uniqueness of orthogonal series.* (Russian) Izv. Akad. Nauk Armjan. SSR Ser. Mat. **4(**1969), 259–266. MR **42** #3485} We will present here a uniformly bounded orthonormal system of smoother functions with the nonuniqueness property.