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*Multiresolution analyses with non-Lebesgue spectrum.* Preliminary report.

The core subspace  $V_0$  of a generalized multiresolution analysis in  $L^2(\mathbb{R}^n)$  is isomorphic to a direct sum  $\bigoplus L^2(S_i, \lambda)$ , where  $\lambda$  is Haar measure on the  $n$ -torus. Using Fourier analysis, one knows that the related matrix filter function  $H$  satisfies a familiar filter equation. In general, i.e., in an abstract Hilbert space, the core subspace of a GMRA is again isomorphic to a direct sum of  $L^2$  spaces, but this time the measures need not be absolutely continuous with respect to Haar measure, and therefore, the analogous filter function need not satisfy the standard filter equation. In this talk, we give some examples and then investigate exactly what properties these filters do have. (Received July 30, 2008)