1030-47-100 **R. T. W. Martin*** (rtwmartin@math.uwaterloo.ca). *Subspaces of $L^2(\mathbb{R})$ with the sampling property.*

A bandlimit can be viewed as a cutoff on the spectrum of the self-adjoint derivative operator $D := i\frac{d}{dx}$ on $L^2(R)$. It is therefore natural to ask whether the subspaces $B(D', A) := \chi_{[-A,A]}(D')L^2(R)$ obtained by cutting off the spectra of more general differential operators D', *e.g.* $D' = -\frac{d}{dx}p(x)\frac{d}{dx} + q(x)$ will have the same desirable properties as the subspace $B(A) = \chi_{[-A,A]}(D)L^2(R)$ of A-bandlimited functions. Namely, will elements of $B(D', A)$ obey a sampling formula? The answer will be yes provided that the multiplication operator M on $L^2(R)$ has a symmetric restriction to $B(D', A)$ with deficiency indices $(1, 1)$ and no continuous spectrum. Indeed, the fact that elements of $B(A)$ obey the Shannon sampling formula is a consequence of the fact that M has a restriction to a dense domain in $B(A)$ with these properties. Our strategy for determining when M and a subspace have these properties is to first seek general necessary and sufficient conditions for an unbounded self-adjoint operator T to have a symmetric restriction to a dense domain in a subspace S which depend on S and bounded operators in the algebra of T. A sufficient condition on the unitary group generated by T will be presented. (Received July 24, 2007)