1037-41-58   **R. T. W. Martin*** (`rtwmartin@math.uwaterloo.ca`), Department of Applied Mathematics, University of Waterloo, 200 University Ave. W., Waterloo, Ontario N2L 3G1, Canada. *Invariant subspaces of differential operators and de Branges spaces.* Preliminary report.

A bandlimit can be viewed as a cutoff on the spectrum of the self-adjoint derivative operator $D := i\frac{d}{dx}$ on $L^2(\mathbb{R})$. Namely, the space $B(\Omega)$ of Ω-bandlimited functions is just the range of the spectral projection $\chi_{[-\Omega,\Omega]}(D)$. It is therefore natural to ask if, given a more general differential operator D', *e.g.* $D' = -\frac{d}{dx}p(x)\frac{d}{dx} + q(x)$, whether the subspaces $B(D',\Omega) := \chi_{[-\Omega,\Omega]}(\Omega)L^2(\mathbb{R})$ obtained by cutting off the spectra of D' will have the same desirable properties as the $B(\Omega)$. Namely, will elements of $B(D',\Omega)$ obey a sampling formula? It is known that $B(\Omega)$ can also be viewed as a de Branges space of entire functions, and that most de Branges spaces obey a sampling formula. Since $B(\Omega)$ is both a de Branges space and an invariant subspace of a differential operator, we seek to answer the previous question by investigating whether the invariant subspaces $B(D',\Omega)$ of more general differential operators could also be de Branges spaces. (Received January 18, 2008)