# On Preserving Essential Spectra and Nullities of Special Expressions in a Weighted Space

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**Abstract**

Special expressions $M_0$ are differential operators of the form

$$M_0 = \sum_{k=0}^{r} c_k t^{\alpha_k} D_t^{\rho_k},$$

where the constants $c_k, \alpha_k$ and $\rho_k$ satisfy certain conditions. We studied the admissible perturbations of these operators, and showed that linear combinations of such perturbations are indeed admissible perturbations of $M_0$. This property gives way to a more interesting result on preserving the essential spectrum and nullity of $M_0$ in the weighted space of measurable functions on the interval $[1, +\infty)$. The study is restricted to the case where $\alpha_1 < \rho_1$.

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