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PROPERTIES OF SOLUTIONS OF A CLASS OF PLANAR ELLIPTIC OPERATORS WITH DEGENERACIES

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In this lecture we will investigate properties of solutions of first and second order elliptic equations that degenerate along a simple closed curve in $\mathbb{R}^2$. These equations are generated by a $\mathbb{C}$-valued vector field L. To the vector field L, we associate the second order operator $\mathbb{P} = \mathrm{Re}\left[L\overline{L} + pL\right]$, where p is a $\mathbb{C}$-valued function.

We will establish a one-to-one correspondence between the solutions of the equation $\mathbb{P}u = 0$ and those of an associated first order equation of type $Lw = Aw + B\overline{w}$.

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