

SEMINÁRIO

ANÁLISE E EQUAÇÕES DIFERENCIAIS

20 outubro 2023 | 13:30 | sala 6.2.33

On the Maximum Principle for higher order operators

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Abstract:

We discuss a general principle of perturbing higher order operators with lower order derivatives in order to restore the maximum principle in the framework in which it is well known to fail. This is somehow delicate and the main ingredient is a new Harnack-type inequality. We first prove De Giorgi type level estimates for functions in $W^{1,t}$, with $t > 2$. This augmented integrability enables us to establish a new Harnack type inequality for functions which do not necessarily belong to De Giorgi's classes as obtained by Di Benedetto-Trudinger for functions in $W^{1,2}$. As a consequence, we prove the validity of the strong maximum principle for uniformly elliptic operators of any even order, in fairly general domains and in any dimension, provided either lower order derivatives or inertial effects are taken into account.