

# Iterates of operators and generalized Gelfand-Shilov classes

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## **Abstract:**

We consider the class of the linear partial differential operators  $A$  in  $\mathbb{R}^n$  with polynomial coefficients, in P.Boggiatto, E.Buzano, L.Rodino (Global Hypoellipticity and Spectral Theory, Akademie Verlag 1996). Namely, we assume that  $A$  is multi-quasi-elliptic with respect to a polyhedron  $\mathcal{P}$ .

Our aim is to investigate the regularity of the solutions of the equation  $Au = 0$ , with  $u$  belonging to  $\mathcal{S}'(\mathbb{R}^n)$ , which are already known to be in  $\mathcal{S}(\mathbb{R}^n)$ . More generally, we want to study the so-called problem of the iterates for the operator  $A$ . To this end, we introduce a generalization of the Gelfand-Shilov classes, basing for the definition on the polyhedron  $\mathcal{P}$ . In this frame, a precise result is given for the problem of the iterates and information on the regularity of the solutions of  $Au = 0$  is deduced.