AST

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CONTENTS

1. SINGULAR HYPERBOLIC SYSTEMS by S.ALINHAC

We study the one sided Cauchy problem for first order hyperbolic systems with symmetrizable principal part and singular lower order terms of the form $\frac{A}{t}$. Sufficient conditions are given for the Cauchy problem to be well posed with zero data and right side in L^2 sufficiently vanishing on t=0.

2. ON THE ANALYTICITY by P.BOLLEY-J.CAMUS-B.HANOUZET

We study the analyticity and the regularity in the classes of Gevrey for boundary values problems in an open set Ω, degenerated on the boundary Γ of the form :

$$Lu(x) = \sum_{h=0}^{\mathrm{Min}(k,2m)} P^{2m-h}(x\,;\,D_x)\left\{\varphi(x)^{k-h}\,u(x)\right\}$$

where k and m are two integers $\geqslant 0$, $P^{2m-h}(x\,;\,D_x)$ is a differential operator of order less than 2m-h, $P^{2m}(x\,;\,D_x)$ is an elliptic operator of order 2m in the set $\overline{\Omega}$ and φ is a regular function equivalent to the distance at the boundary Γ. The method is an adaptation of that of C.B.Morrey and L.Nirenberg.

3. ON THE PARTIAL HYPOELLIPTICITY AND HYPOANALYTICITY by P.BOLLEY and J.CAMUS

We study the partial hypoellipticity (i.e. hypoellipticity from a space of distributions which are C^∞ in the normal direction) and the hypoanalyticity for the differential operator defined on the set $\mathbb{R}\times\mathbb{R}^n = \left\{(t,x)\;;\; t\in\mathbb{R}\,,\; x\in\mathbb{R}^n\right\}$ by :

$$Lu(t,x) = \sum_{h=0}^{\mathrm{Min}(k,2m)} P^{2m-h}\left\{t^{k-h}\,u(t,x)\right\}$$

where k and m are two integers $\geqslant 0$, P^{2m-h} is a differential operator of order less than 2m-h, P^{2m} is an elliptic operator of order 2m in $\mathbb{R}\times\mathbb{R}^n$.
Partial hypoellipticity is proved by the method of the differential quotients from an a priori estimate ; and hypoanalyticity is proved by an adaptation of the method of C.B.Morrey and L.Nirenberg.

4. HYPOELLIPTICITY FOR A CLASS OF DEGENERATE PARABOLIC EQUATIONS by B.HELFFER

We construct parametrices for degenerate parabolic equations of order **2m** and deduce from this construction hyppoellipticity results.

5. NON HYPOELLIPTICITY FOR A CLASS OF DIFFERENTIAL OPERATORS by B.HELFFER and C.ZUILY

We study in this paper, from the point of view of hypoellipticity, the following class of partial differential equations introduced by M.S.Baouendi and C.Goulaouic

$$P = t^k D_t^m + a_{m-1}(x)\, t^{k-1} D_t^{m-1} + \dots + a_{m-h}(x)\, D_t^{m-k} + \sum_{p=0}^{m-1} \sum_{|\beta| \leqslant m-p} t^{\alpha(p,\beta)} D_t^p\, a_{p\beta}(x,t)\, D_x^\beta \quad ; \quad k \in \mathbb{N}$$

with $\alpha(p,\beta) = \mathrm{Max}\,(0, k+p-m+1)$.

We prove the non hypoellipticity of these operators when $k > 0$ in construction non smooth solutions of $Pu \in C^\infty$.