# ICM 1998, Berlin, Aug. 18–27

## Abstracts of Short Communications and Posters

### Section:

## 10. Partial Differential Equations

1991 MS Classification: 35

Matsumoto, Waichiro, Ryukoku University/Université de Paris VI

**On the Cauchy-Kowalevskaya theorem of Nagumo type for systems**

We consider the Cauchy problem for system:

$$(\mathrm{C}) \quad \begin{cases} D_t u - \sum_{|\alpha|\leq m} A_\alpha(t,x) D_x^\alpha u = f(t,x), \\ u|_{t=t_o} = u_o(x), \end{cases}$$

where m and N are natural numbers, $u$, $u_o$, and $f$ are vectors of dimension N and $A_\alpha$ are square matrices of order N. When all coefficients are real analytic on $t$ and $x$, H. Yamahara and I gave the necessary and sufficient condition in order that (C) has an unique solution for each real analytic $u_o$ and $f$. (See [1].) On the other hand, when $N = 1$, the regulariry on t of the coefficients is relaxed to $C^0$-class. We consider the case of $N > 1$ and give an example, where (C) has not in general a classical solution for real analytic $u_o$ and $f$ in $x$ if $(m-1)N > 4p$. (The coefficients depend only on $t$ and belong to $C^{p-1,1}$.) We also consider a sufficient condition, which is almost necessary in some restricted case.

Ref. [1] W. Matsumoto and H. Yamahara, On the Cauchy-Kowalevskaya theorem for systems, *Proc. Japan Acad.* **67** *Ser. A, No.6* (1991) 181–185.