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*Singularities of solutions to the Cauchy problem for a class of second-order hyperbolic operators*

### Abstract

We deal with the Cauchy problem for second-order hyperbolic operators in the case where the coefficients of their principal parts are real analytic functions depending only on the time variable. We shall give outer estimates of the wave front sets of solutions to the Cauchy problem under the conditions given in [1]. Under these conditions the Cauchy problem is  $C^\infty$  well-posed, and the conditions are necessary for  $C^\infty$  well-posedness when the space dimension is less than 3 or the coefficients of the principal parts are semi-algebraic functions ( *e.g.*, polynomials). More precisely, we shall show that the wave front sets of solutions are included in the union of broken null bicharacteristics emanating from the singularities of data in non-trivial cases.

### BIBLIOGRAPHY

- [1] Wakabayashi, S., *On the Cauchy problem for second-order hyperbolic operators with the coefficients of their principal parts depending only on the time variable*, Funkcialaj Ekvacioj, **55**, 99-136 (2012).