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EXISTENCE AND NON-EXISTENCE OF NULL-SOLUTIONS FOR SOME NON-FUCHSIAN PARTIAL DIFFERENTIAL OPERATORS WITH *T*-DEPENDENT COEFFICIENTS

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Dedicated to Professor S. Matsuura on his 60th birthday

§0. Introduction

Since M. S. Baouendi and C. Goulaouic ([2], [3]) defined partial differential operators *of Fuchs type* and proved theorems of Cauchy-Kowalevskaya type and Holmgren type, many authors have investigated operators of Fuchs type in various categories, that is, real-analytic, C^∞ and so on. (Cf. [1], [4], [6], [8], [9], [11], [12], [17], [18], [19], [20], [21] etc.)

DEFINITION 0.1. A partial differential operator P is called *of Fuchs type* (or *Fuchsian*) *with weight* $m - k$ $(0 \le k \le m)$, when P has the following form:

$$P = t^k\partial_t^m + a_1(x)t^{k-1}\partial_t^{m-1} + \cdots + a_k(x)\partial_t^{m-k} + \sum_{\substack{j+|\alpha|\le m\\ j\le m-1}} t^{\max(0,j+k-m+1)}a_{j,\alpha}(t,x)\partial_t^j\partial_x^\alpha, \tag{0.1}$$

where $a_j(x)$, $a_{j,\alpha}(t,x)$ are smooth, that is, real-analytic, C^∞ and so on. (Notations are given later.)

Remark 0.2. Note that the operator P is Fuchsian with weight $m - k$ if and only if $t^{m-k}P$ is Fuchsian with weight 0.

It has become known that Fuchsian operators have various "good" properties. Among them, we are concerned with the following uniqueness property. (See also [17].)

THEOREM 0.3 ([2]). *If P is Fuchsian with real-analytic coefficients, then there exists a positive integer N depending on P such that the following holds*:

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