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Problems with conjunction on a characteristic plane for the third-order hyperbolic equation in the three-dimensional space. (Russian. English summary) [Zbl 1413.35298](#)

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Summary: In the present article the full equation of hyperbolic type of the third order with set of variable factors, in the area representing an infinite triangular prism, limited to the characteristic planes $z = 0$, $x = h$ of the given equation and two noncharacteristic planes $y = x$, $y = -x$ is considered. Two boundary-value problems with data on the edges of the prism, which are both characteristic and non-characteristic planes of the given equation, are solved. In connection with difficulties of a gluing together of considered type solutions of the hyperbolic equations and the representation of conditions of interface on performance integrals and fractional derivatives have been introduced into interface conditions. On the interior characteristic plane the matching conditions, containing fractional order derivatives of required function, are established in order to avoid troubles with intersection of solutions. For equation considered in this article we have obtained the solution of the Darboux problem by method of Riemann, taken for the basis solutions of both problems, which are reduced to uniquely solvable equations of Volterra and Fredholm respectively, that has allowed to obtain the solutions of problems in the explicit analytic form.

MSC:

[35L25](#) Higher-order hyperbolic equations

[35L35](#) Initial-boundary value problems for higher-order hyperbolic equations

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Keywords:

[integral equations](#); [boundary value problems](#); [higher order hyperbolic type equations](#)

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