## The representations of the solutions of the wave equation based on wavelets

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The work deals with the application of the continuous wavelet analysis when solving the wave equation. The boundary-initial value problem in the half-space is solved by means of this analysis. The basic idea of the work is to expand the boundary data in terms of certain time-space wavelets. The mother wavelet is constructed by using the previously found localized solution of the wave equation. It has good properties. It is exponentially localized in space-time, it has zero moments of any order, under certain conditions its asymptotics coincides with the Morlet wavelet. The family of wavelets which are employed for the decomposition of the required solution are found by means of scaling, translations and the Lorentz transformations. The corresponding reconstruction formula has been derived. Finally we have obtained the integral representation of the required solution as a superposition of the known localized solutions.