

Integration of the Equations of Long Waves in the Channels and Jets

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The equations for long waves on the water surface are represented in the form of the shallow water equations in the Boussinesq approximation. The Boussinesq approximation takes into account the transverse acceleration of liquid particles. The total pressure at the cross section area of the flow is expressed in the form of Lagrange equations (Drozdova, Kulikovskii 1996). Lagrange function depend on cross-section area and its derivative. For the steady-state motion in the general case we have formed three integrals, where are arbitrary constants of integration. As a result we obtained the analytical solutions of many problems for cnoidal-type and solitude waves in channels of different forms taking into account surface tension or an elastic film. <http://ictam04.ippt.gov.pl>

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