Thesis	The Propagation of Water Waves over Variable Depth in the Variable-Coefficient Korteweg-de Vries Equation
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ABSTRACT

The propagation of water waves in the variable-coefficient Korteweg-de Vries (KdV) equation, $2S\frac{\left(U_0+D\sqrt{D}\right)}{D\sqrt{D}}\eta_{00X}+\frac{3}{(U_0+D\sqrt{D})}\eta_{00}\eta_{00\xi}+\frac{D^5}{3\left(U_0+D\sqrt{D}\right)^3}\eta_{00\xi\xi\xi}=0$, is described. The coefficients of the KdV equation is particular for the equation. This equation was transformed from Euler's equation , together with the equation of mass conservation and suitably boundary conditions. Double asymptotic expansion , a part of singular perturbation method , is used. This expansion is introduced two small parameters that are ε , amplitude of the wave and σ scale of the depth variation into the problem. Terms $O(1)$ and $O(\varepsilon)$ are only retained in this research. Finally , KdV equation , mentioned above , is obtained to describe the water waves increases in depth and in height as decreases in width in the river.