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Generation and analysis of the second order difference scheme for the Kortevog-de Vries equation

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In this work we consider Kortevog-de Vries equation and apply to it our approach based on difference elimination by construction of a Groebner basis. As a result, we obtain finite difference approximation with second-order accuracy for the space and time. This scheme is consistent with Kortevog-de Vries equation and stable due to it is implicit. Therefore, our scheme is convergent. We made comparison, on the exact soliton solution, the numerical behavior of scheme with that of two known schemes of the same order of approximation and show that our scheme provides substantially better numerical accuracy.

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