

## Mathematics &gt; Numerical Analysis

# Lyapunov Computational Method for Two-Dimensional Boussinesq Equation

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A numerical method is developed leading to Lyapunov operators to approximate the solution of two-dimensional Boussinesq equation. It consists of an order reduction method and a finite difference discretization. It is proved to be uniquely solvable and analyzed for local truncation error for consistency. The stability is checked by using Lyapunov criterion and the convergence is studied. Some numerical implementations are provided at the end of the paper to validate the theoretical results.

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