# Multi-grid Beam and Warming scheme for the simulation of unsteady flow in an open channel

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## Abstract

In this paper, a multi-grid algorithm is applied to a large-scale block matrix that is produced from a Beam and Warming scheme. The Beam and Warming scheme is used in the simulation of unsteady flow in an open channel. The Gauss-Seidel block-wise iteration method is used for a smoothing process with a few iterations. It is also shown that the governing equations determine the type of prolongation and restriction operators for the multi-grid algorithm.

**Keywords**: Multi-grid algorithm, Beam and Warming scheme, open channel flow