

INTEGRAL AND DIFFERENTIAL FORMULATION IN RESERVOIR ROUTING

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Abstract: The reservoir routing problem describes relationship between incoming and outcoming quantity of water when there is retention of certain volume present in the flow. The problem has been recognized and dealt with for quite some time but this paper offers new insights by presenting the problem in sound mathematical formulation based only on the mass conservation principle. Application of the mass conservation principle enables all formulations to be presented: integral and differential formulations based on either the water content or on the water level in the reservoir. During the solution process some new functions with clear physical meaning have been introduced in order to facilitate the solution procedure. It becomes evident that some formulations are more advantageous in terms of stability or simplicity. Calculations in the examples are based on real data from the artificial water accumulation Botonega in Croatia.

Keywords: reservoir routing, mass conservation principle, integral formulation, differential formulation, numerical methods.



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