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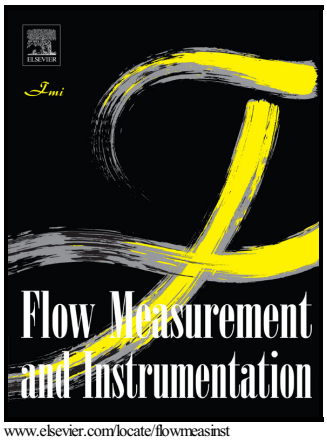

www.elsevier.com/locate/flowmeasinst

PII: S0955-5986(15)30002-9
DOI: http://dx.doi.org/10.1016/j.flowmeasinst.2015.08.002
Reference: JFMI1113

To appear in: *Flow Measurement and Instrumentation*

Received date: 21 November 2014
Revised date: 3 August 2015
Accepted date: 10 August 2015

Cite this article as: Amir Hossein Zaji, Hossein Bonakdari and Sohrab Karimi, Radial basis neural network and particle swarm optimization-based equations for predicting the discharge capacity of triangular labyrinth weirs, *Flow Measurement and Instrumentation,* http://dx.doi.org/10.1016/j.flowmeasinst.2015.08.002

Radial basis neural network and particle swarm optimization-based equations for predicting the discharge capacity of triangular labyrinth weirs

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Abstract

Conventional weirs are utilized for controlling, measuring and adjusting the flow depth in hydraulic structures, such as those found in irrigation and drainage networks. Various weirs with modified shapes are utilized to increase the discharge capacity. The main goal of this study is to investigate the discharge coefficient (Cd) of triangular labyrinth weirs using soft computing methods. The performance of the radial basis neural network (RBNN) is compared with that of Multiple Nonlinear and Multiple Linear Particle Swarm Optimization (MNLPSO and MLPSO). Models developments are conducted using published experimental data from the literature. Comparing the RBNN, MLPSO and MNLPSO results obtained through these soft computing techniques with experimental data shows that all models perform well in predicting the discharge coefficient of a triangular labyrinth weir. Performance of the proposed approaces demonstrated which explicit equation given by MNLPSO model provided the discharge capacity with lower