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# Usage of Two Transmitted Detectors with Optimized Orientation In order to Three Phase Flow Metering

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## Abstract

Artificial neural network (ANN) is a good technique used to handle problems of modeling, prediction, control, and classification. In this study, four accurate and precise MLP model were developed. The first one was used in order to determine the type of three phase flow regime. All of the regimes were recognized correctly. Then, according to determined regime, three independent MLP models were used in order to predict the volume fraction percentages of gas, oil and water. The networks were developed based on the validated simulated data from MCNPX code. The volume fractions were measured with Mean Relative Error (MRE) of less than 1.63 %.

**Keywords:** Regime identification, Volume fraction determination, Multi-layer perceptron, Gamma ray, Multiphase flow, Multi beam technique.

## 1. Introduction

During the last three decades, development, evaluation, and use of multiphase-flow-measurement (MFM) systems have been a major focus for the oil and gas industry worldwide. Within the oil and gas industries, it is recognized that MFMs have several benefits in applications such as layout of production facilities, well testing, reservoir management, production allocation, and production monitoring [1]. Conventional test separators have many disadvantages such their large space for installing hard-wares, more capital and operating expenses, and requiring much time to monitor each well's performance [2-4].

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