

# Numerical Model for Simulation of Flow in Pipeline With Leaks

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## Abstract

The accurate simulation of flow in pipes with leak is an important issue in most of the computational leak detection systems, for that reason, an improved numerical model for flow simulation is presented. The model takes into account the mass, and momentum conservation equation and is discretized by means of finite difference method, resulting in a single phase flow numeric model for pipes with leaks. The numerical model is able to generate pressure and flow rate profiles of the entire pipeline, supposing just two boundary condition at the extremes of the pipe. Comparison against experimental data shows that model and properties subroutine are capable to reproduce the leaking behavior of pressure and flow rate of the boundaries of the pipe. Further uses of the simulator includes the usage of model in system for the purpose of leak detection and the accurate simulation of pressure profile of pipes with leaks (Kam, 2010).

## References

1. KAM SEUNG IHL. Mechanistic modeling of pipeline leak detection at fixed inlet rate. (2010) Journal of Petroleum Science and Engineering, 70(3-4), 145–156. <http://doi.org/10.1016/j.petrol.2009.09.008>.