

Implementation of I-kaz with Teager-Kaiser Energy Operator in Solving Leakage Problem using Synthetic Signal

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Abstract. Transient event usually happen due to pressure surge inside water pipeline network by either opening or closing valve rapidly or water hammer phenomena. This paper focus on identification of leak signature using Empirical Mode Decomposition (EMD) with the implementation of Ikaz-kurtosis ratio while Teager Kaiser Energy Operator (TKEO) use as instantaneous frequency analysis (IFA). Two synthetic signal with different pipe characteristics was construct using transmission line modelling (TLM). It is show that Ikaz-kurtosis ratio give good result in selecting the intrinsic mode function (IMF) after EMD decomposed the signal into a series of IMFs. TKEO as post processing analysis extract all the information inside the signal that contaminated with noise. Its show that leakage position can be localize with maximum error less 7.3%. Meanwhile, Outlet position recorded 3.4% maximum. This conclude that this method apply for synthetic signal is acceptable for leakage detection.