



A new approach to detect changes in river flow conditions

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Detecting changes of river flow is very difficult due to complex interactions between many physical factors affecting it. As usual in such cases, the main problem consists in separating and relating different causes and effects. In this study a new approach to detect changes of flow in a river reach is presented. Methods used in the proposed framework are based on the information included in discharge and water level measurements at a number of gauging stations located along the River Vistula reach, used as a case study. The new approach consists of parallel application of three different methods. The first two are statistical methods, including Specific Gauge Analysis (SGA) and Analysis of Normalized Differences of Quantiles (ANDQ). The third applied method models changes in flow dynamics using the Stochastic Transfer Function (STF) model. Results of the analysis demonstrated the usefulness of the parallel approach to detect changes in flow condition associated with various forcing occurring in the river channel. The analysis indicates that flow condition in the studied Middle Vistula reach are mainly influenced by morphological processes taking place in the river channel.

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