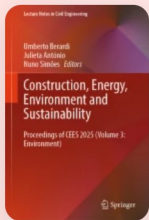


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Hydraulic Modelling in Residential Buildings Using EPANET Software

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Abstract

The EPANET software is commonly used for hydraulic modelling of drinking water distribution systems (DWDS). It is free and has been extensively used in the academic environment and by water utilities professionals. Although well established for DWDS, its application to plumbing distribution systems (PDS) has not been yet broadly used nor

explored. PDS may be fewer complex systems in terms of hydraulics, such as not being looped and having less consumption nodes (i.e., end-uses). Also, water losses may be not as relevant, i.e., in magnitude and number of occurrences. The use of hydraulic modelling will also need to be tailored to the building, as influenced by consumer habits and consumption profiles. Herein, the EPANET software was explored as a possible tool to assess the performance of plumbing systems and support decision-making. A basic four-storey residential building hydraulic model of a simple conceptual PDS was designed, considering legal criteria and requirements, with consumption patterns addressed to the regular residential water uses. Daily and instantaneous patterns were defined based on profiles available in literature, adapted to the national context, considering weekdays (i.e., 120-h). Results showed the potential of EPANET to help decision-making, particularly in retrofit cases, particularly if based on specific diagnosis for a building. Not only targeted at hydraulics, but also regarding water quality, real-time monitoring should be considered to support modelling.

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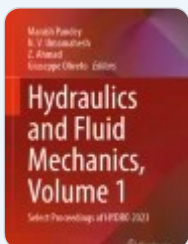
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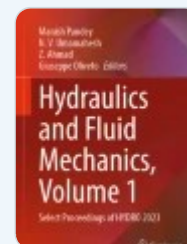


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Ethics declarations

The authors have no competing interests.

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