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## SuperflexPy: a new open source framework for building conceptual hydrological models

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Hydrological models represent a fundamental tool for linking data with theories in scientific studies. Conceptual models are among the most frequently used type of models in catchment scale studies, due to their low computational requirements and ease of interpretation. Model selection requires the comparison of model alternatives, which is complicated by differences in conceptualization, implementation, and source code availability of the models present in the literature. For this reason, several model-building frameworks have been introduced in the last decade, which facilitate model comparisons by enabling different model alternatives within the same software and numerical architecture. These frameworks, however, have their own limitations, including the difficulty of extension from a user perspective, the requirement of long set-up procedures, and the need of customized input files.

Building on the decennial experience with the development and usage of Superflex, a flexible modeling framework for conceptual model building, so far implemented in FORTRAN language and not available as open source, we propose SuperflexPy, an open source Python framework for building conceptual hydrological models. SuperflexPy allows the user to build fully customized models using generic elements (i.e. reservoirs, splitters, junctions, lag functions, etc.) and to arrange them as desired, for example to reflect lumped or semi-distributed model configurations. SuperflexPy is easy to configure through modular initialization scripts, easy to extend with custom functionalities, and easy to interface with other frameworks, making it an essential element for creating a continuous and reproducible pipeline that goes from raw data to model results and interpretation.

In this presentation, we will introduce this framework, showcasing some applications and highlighting its potential in the context of open science.