Using the GR hydrological modelling with the R packages airGR and airGRteaching

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Rainfall-runoff models are useful and convenient tools for research and engineering as a mean to simulate streamflows from meteorological variables. Applications of rainfall-runoff models range from flood risks estimation, to water resources management and low-flow related issues. The family of the conceptual GR models has been developed by the Catchment Hydrology Group at INRAE (France) over the past 30 years with the main objective of designing models that are as efficient as possible in terms of streamflow simulation, and are applicable to a wide range of catchments and have low data requirements. Recently, two open-source packages, airGR and airGRteaching, have been developed at INRAE for the R free software environment, in order to provide access to its hydrological models. Namely, the GR4H, GR4J, GR2M and GR1A, which can be run at the hourly, daily, monthly and annual time steps, are available among others. The packages also include a snow accumulation and melt module, a calibration tool, different efficiency criteria and plotting facilities. While airGRteaching is designed for simple applications and requires limited coding knowledge and also offers a graphical user interface, airGR is more flexible, with various modelling options available through more advanced programming efforts (but still reasonable).

This training is open to people seeking for information on the family of the GR hydrological models who would like to get an overview about the potential use of the airGR and airGRteaching packages. The training takes place over half a day (3 h) according to the following program:

1. How the GR models work
2. General information about the packages
3. The airGRteaching package
4. The airGR package
5. How to find out how packages work
6. Some application of the packages