



# airGRteaching

an R-package designed for teaching hydrology with lumped hydrological models

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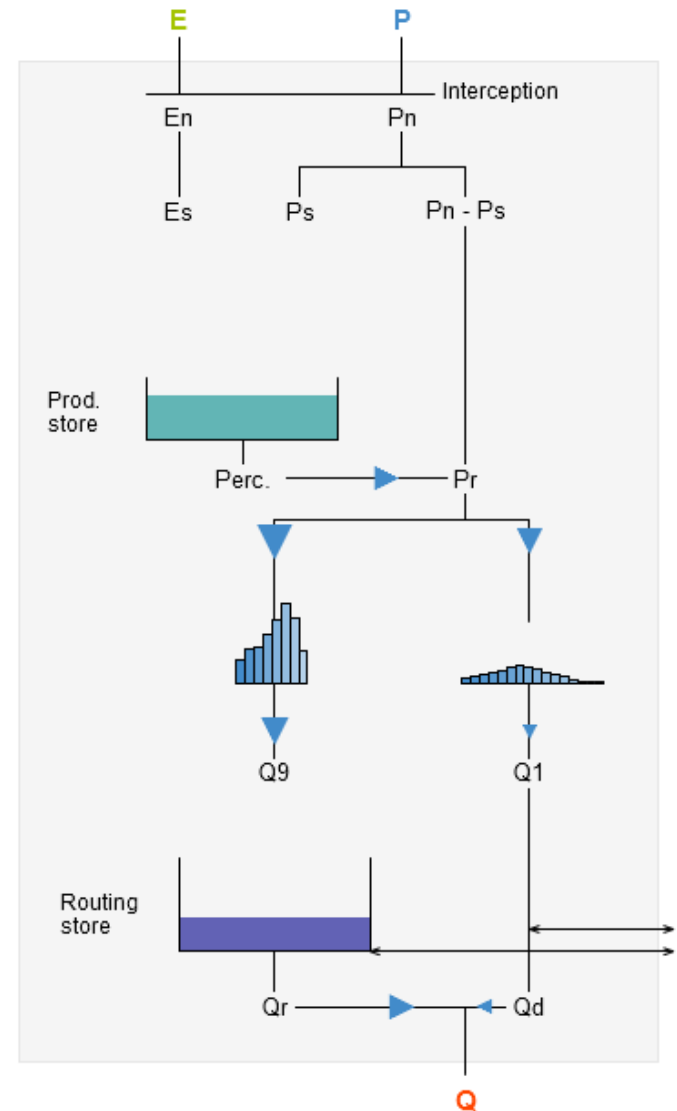
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26<sup>th</sup> April 2017



Based on the airGR R-package:

- 3 daily models up to now (including GR4J)



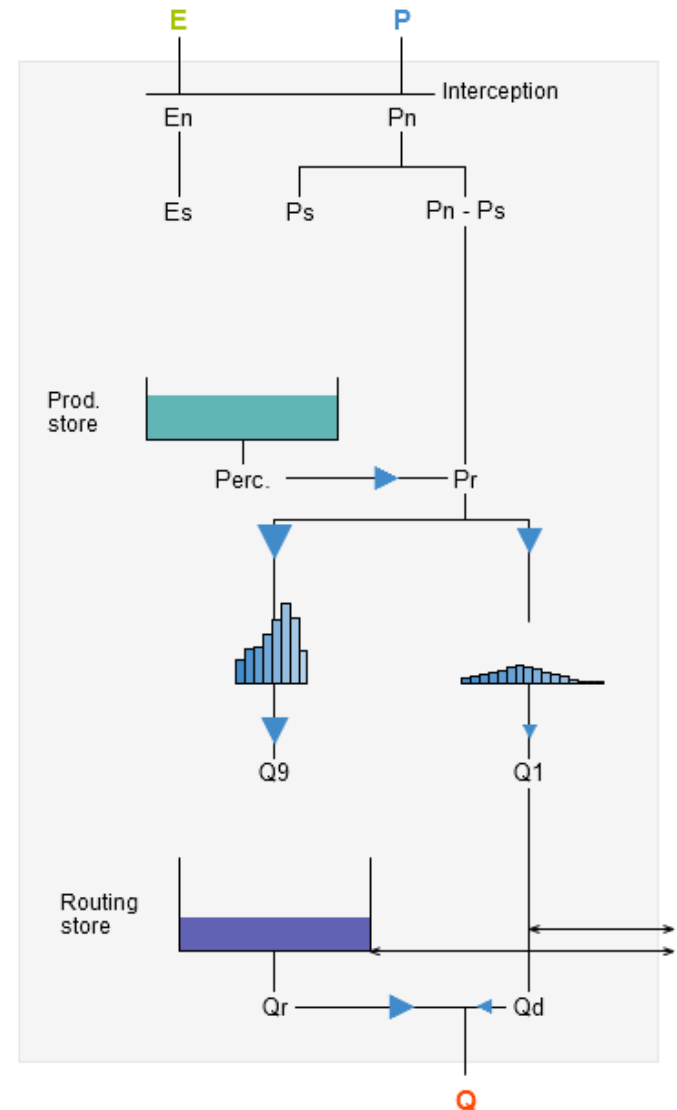
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Basic level of programming required

Only 3 simple functions for a full modelling exercise

- Preparation of data
- Model calibration
- Model simulation



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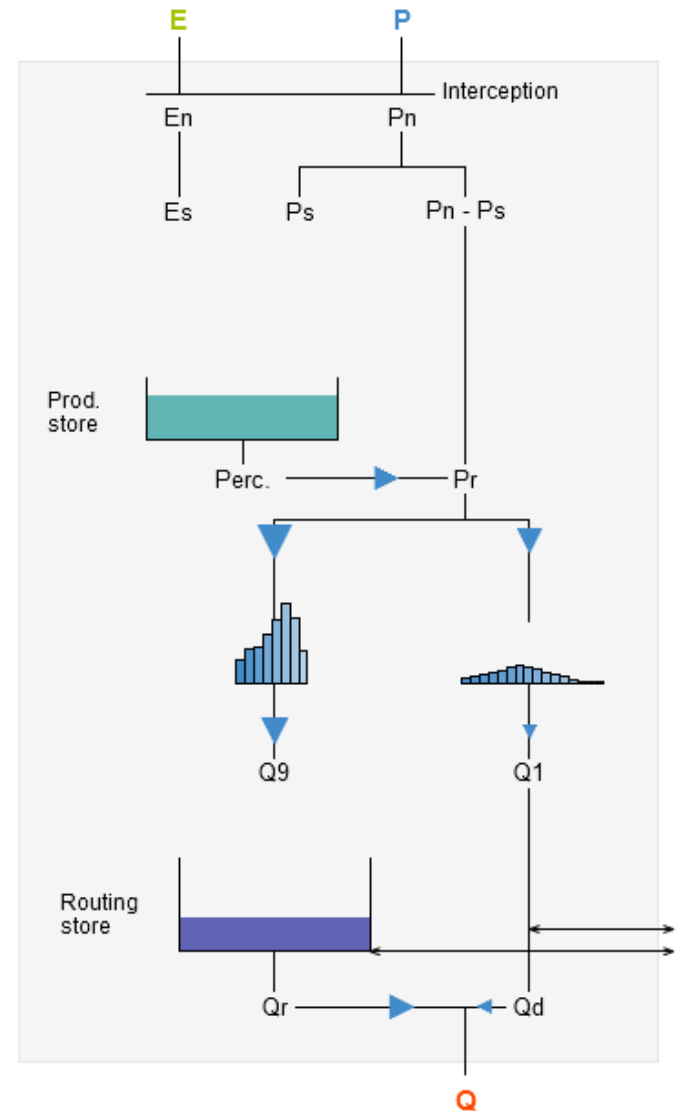
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- Mouse events and interactive graphics



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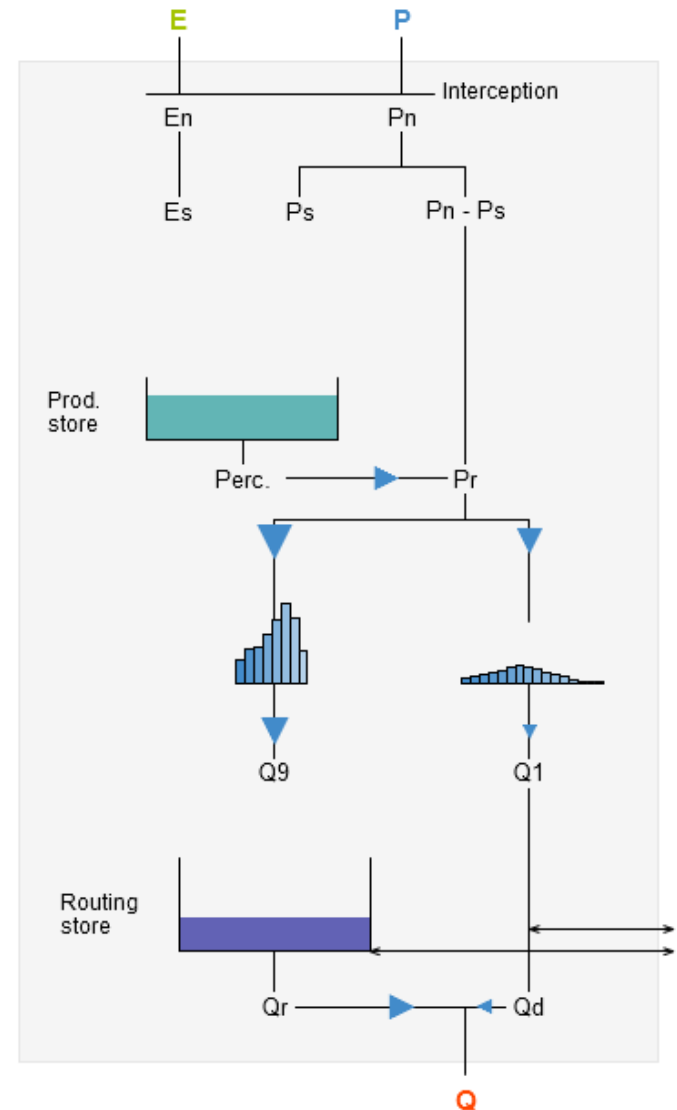
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Graphical interface based on a Shiny interface

- Interactive flow simulation with parameters modifications
- Automatic calibration
- Internal variables evolution
- Time period selection



Choose a dataset:  
 Low-land basin

Choose a model:  
**Hydrological model**: GR4J  
**Snow module**: None

Parameters values:

**X1 (production store capacity)**: 200 [mm] (range 0 to 2,500)

**X2 (intercatchment exchange coeff.)**: 0 [mm/d] (range -4 to 4)

**X3 (routing store capacity)**: 100 [mm] (range 0 to 1,000)

**X4 (unit hydrograph time constant)**: 2 [d] (range 0.5 to 10)

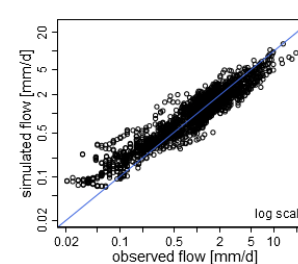
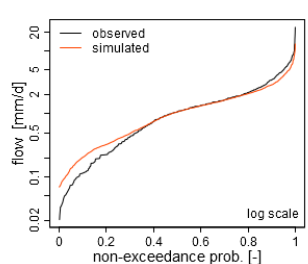
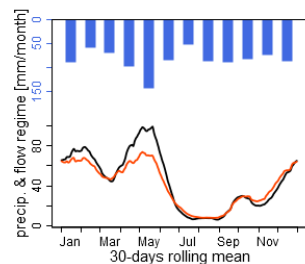
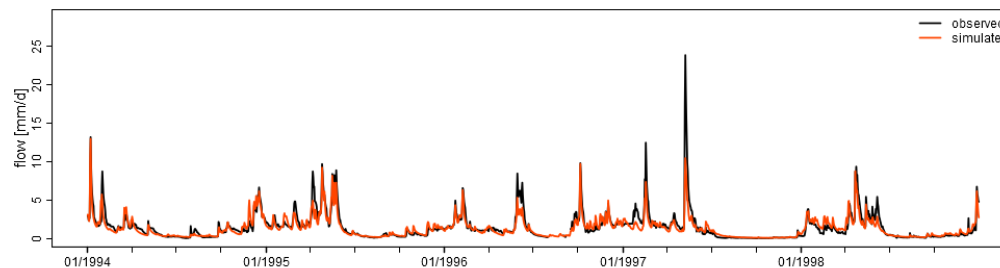
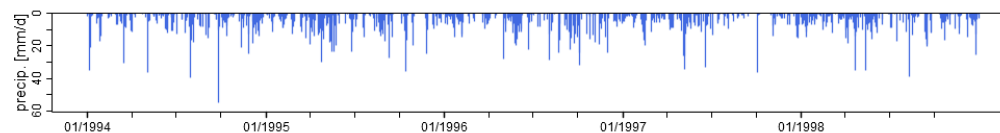
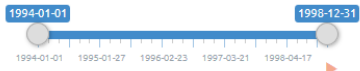
Automatic calibration (with KGE [Q]):

Run

Choose a plot:

Model performance

Select the time window:



Criteria	Value
NSE [Q]	0.78
NSE [log(Q)]	0.87
NSE [sqrt(Q)]	0.86
KGE [Q]	0.71
KGE [log(Q)]	0.54
KGE [sqrt(Q)]	0.82