GR hydrological models

- Designed with the objective to be as efficient as possible for flow simulation at various time steps (from hourly to annual)
- Warranted complexity structures and limited data requirements
- Can be applied on a wide range of conditions, including snowy catchments (CemaNeige snow routine included)

From airGR to airGRteaching

- The GR hydrological models have been implemented in airGR (Coron et al., 2019)
- airGRteaching (Delaigue et al., 2019) depends on airGR. It offers simplified functionalities that are particularly suitable for teaching hydrology

Main components of the airGR package

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Data preparation, calibration and simulation with the GRJ model (CemaNeige snow module)

```
data(L0123002)
BasinObs <- BasinObs[, c("Dates", "Precip", "ETP", "Qmm", "Temp")]
## ... c("1994-01-01", "1998-12-31")
## Crit. NSE[Q] = 0.8376
## plot giving an overview of the model outputs
plot(Sim)
```

```
Sim <- SimGR(PrepGR = Prep, CalGR = Cal, EffCrit = "NSE", WupPer = NULL, SimPer = c("1994-01-01", "1998-12-31"))
plot(Cal, which = "ts", main = "Calibration step")
```

```
Cal <- CalGR(PrepGR = Prep, CalCrit = "KGE", verbose = FALSE, WupPer = NULL, CalPer = c("1990-01-01", "1993-12-31"))
```

```
ZInputs = median(BasinInfo$HypsoData), HypsoData = BasinInfo$HypsoData)
```

Warranted complexity structures and limited data requirements

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