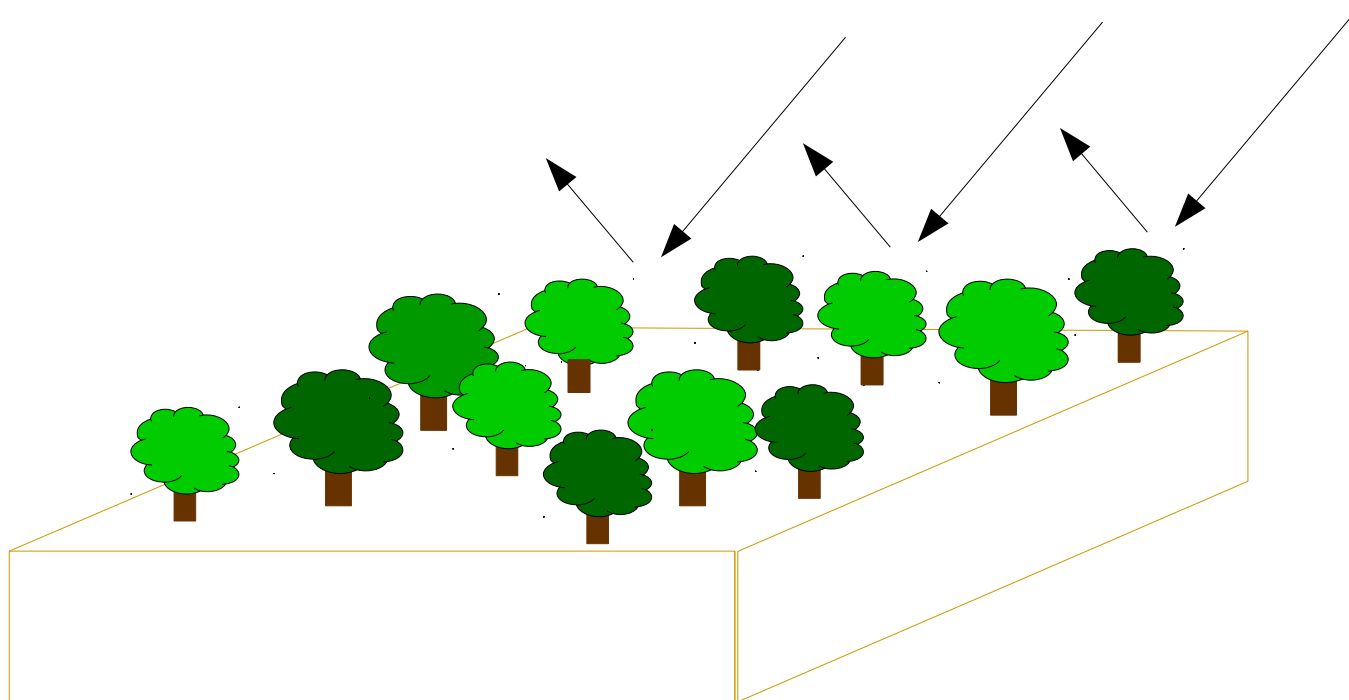


Stochastic Soil and Vegetation Parameterizations in Regional Climate Simulations for Europe

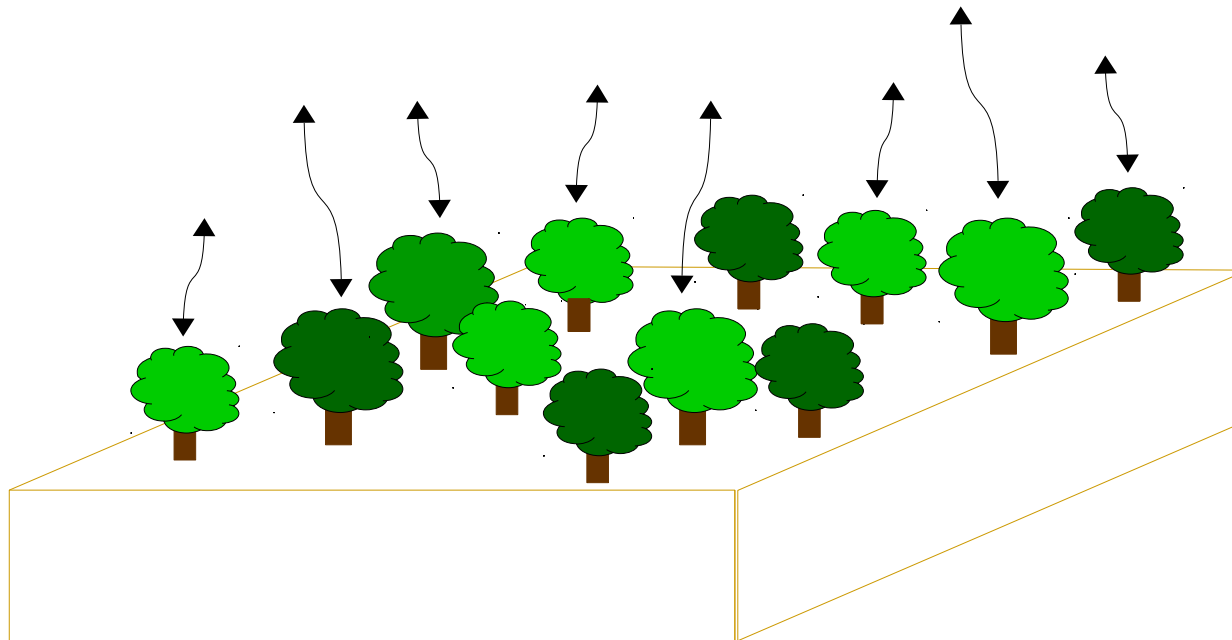
Marcus Breil

Institute of Meteorology and Climate Research,
Karlsruhe Institute of Technology (KIT)

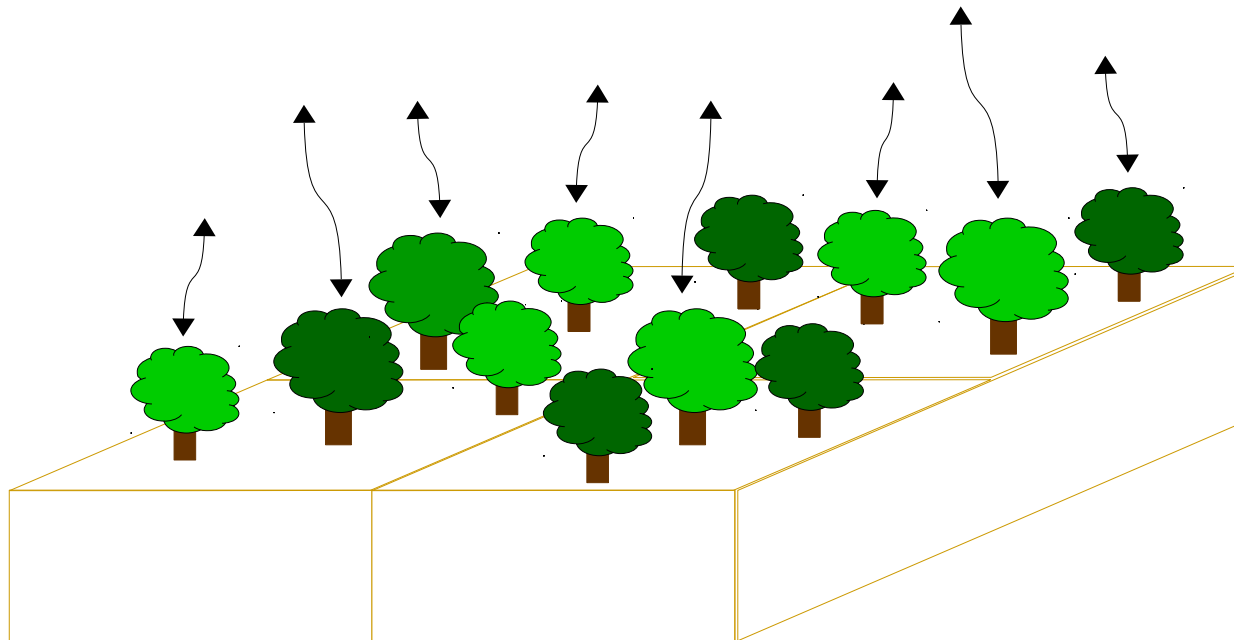
Soil-Vegetation-Atmosphere Interaction



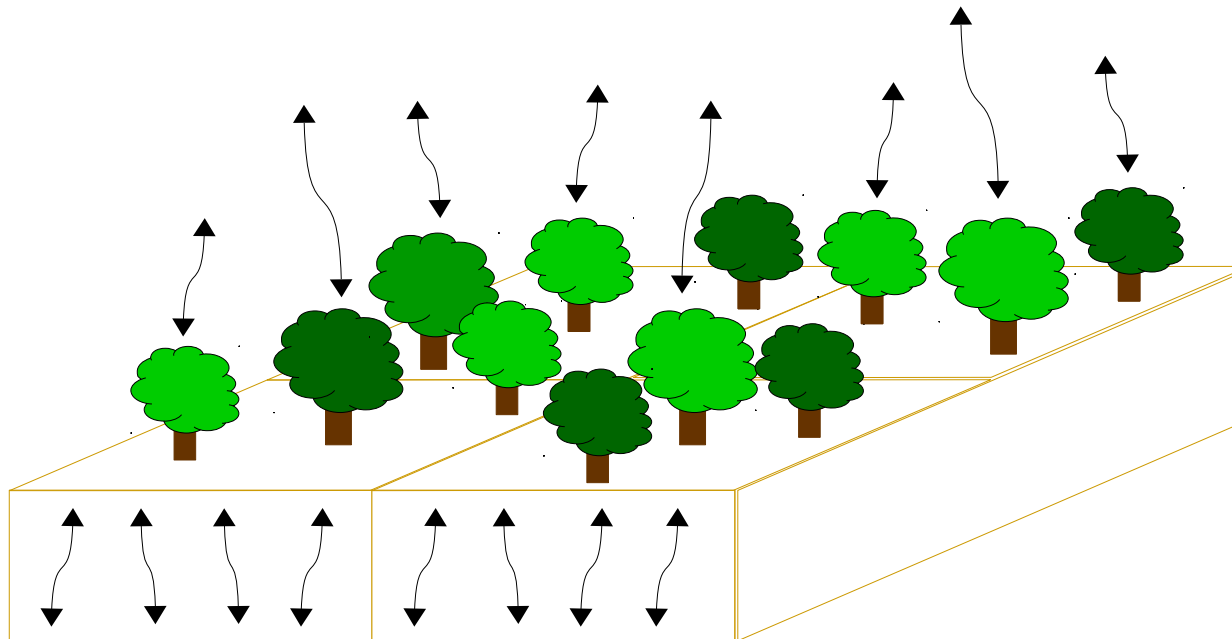
Soil-Vegetation-Atmosphere Interaction



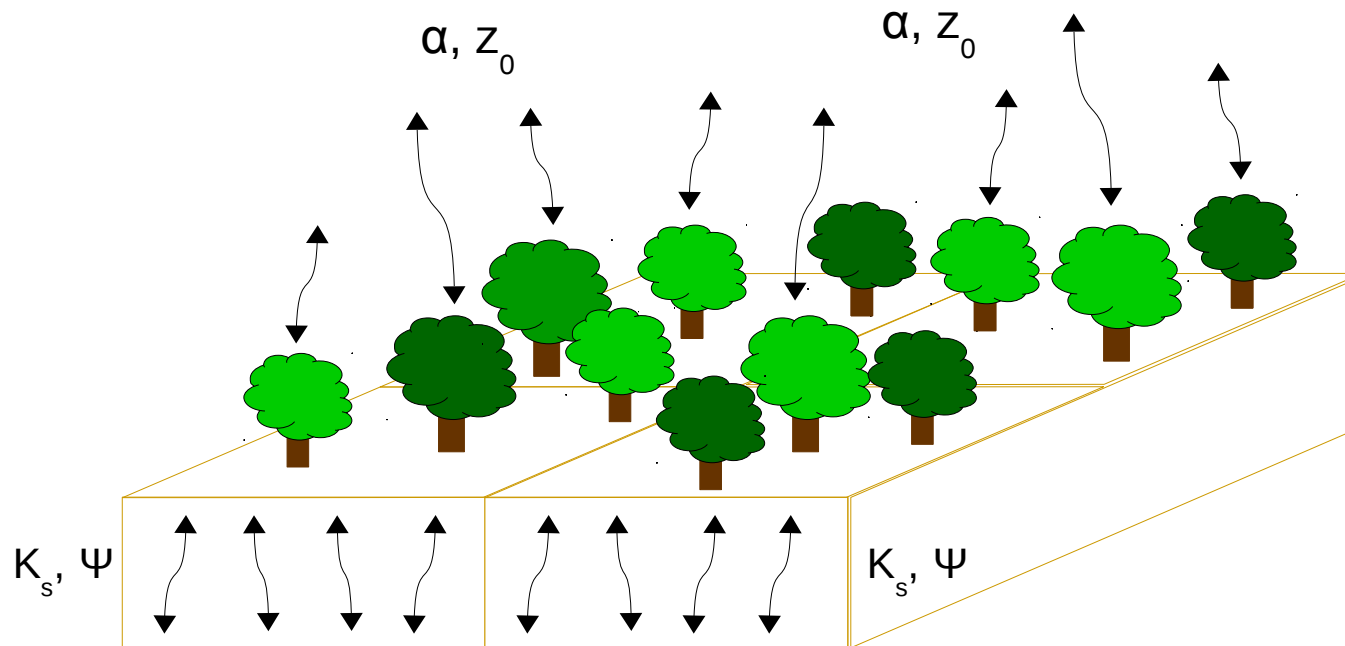
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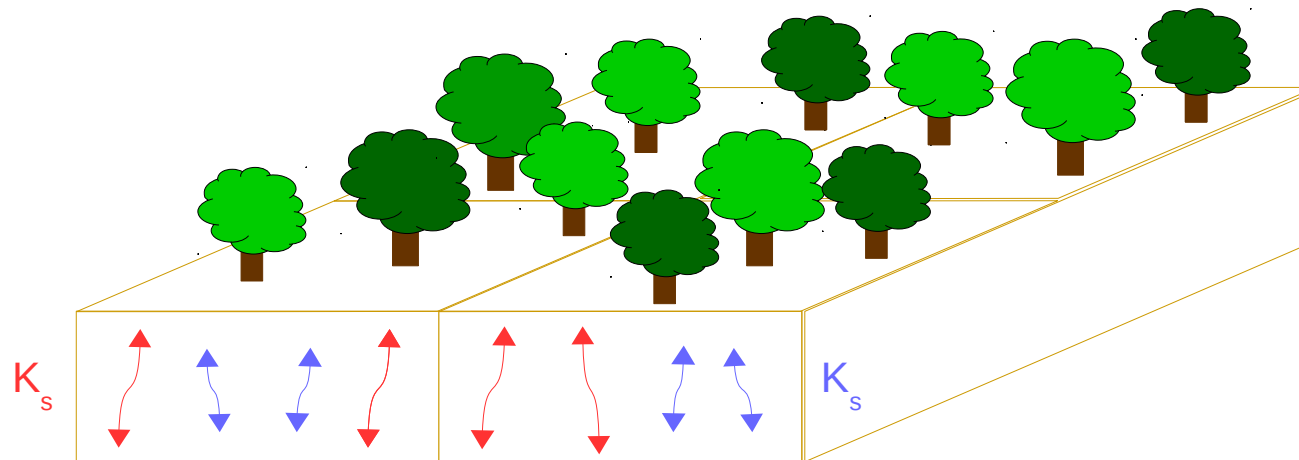
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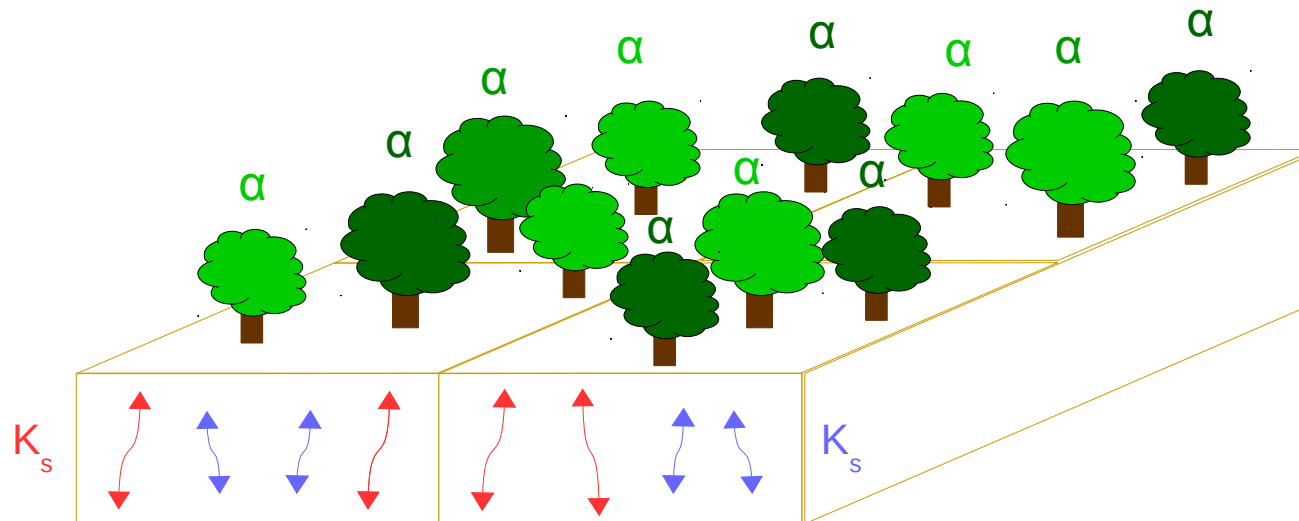
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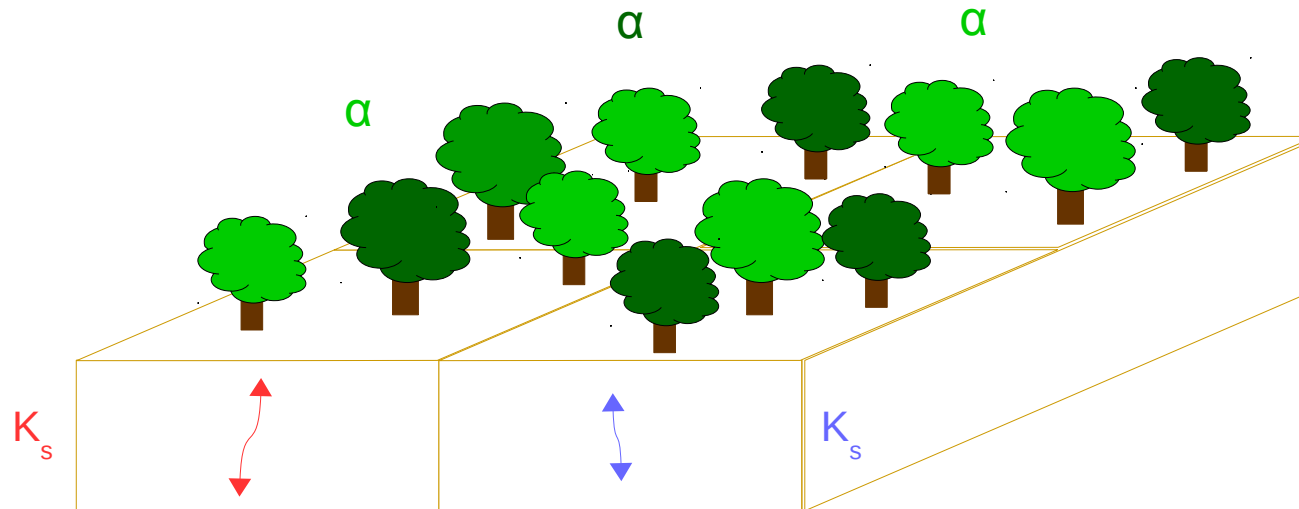
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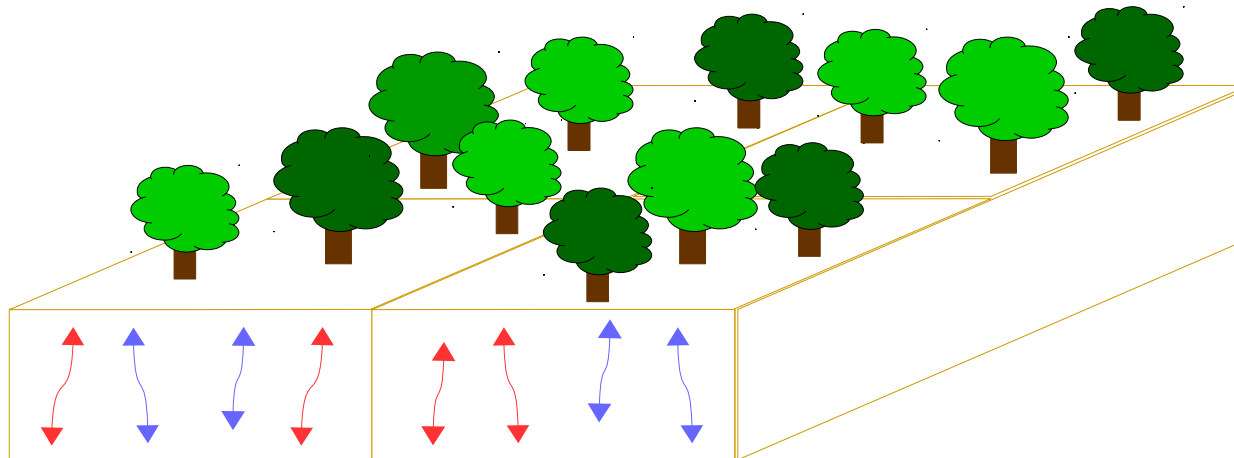
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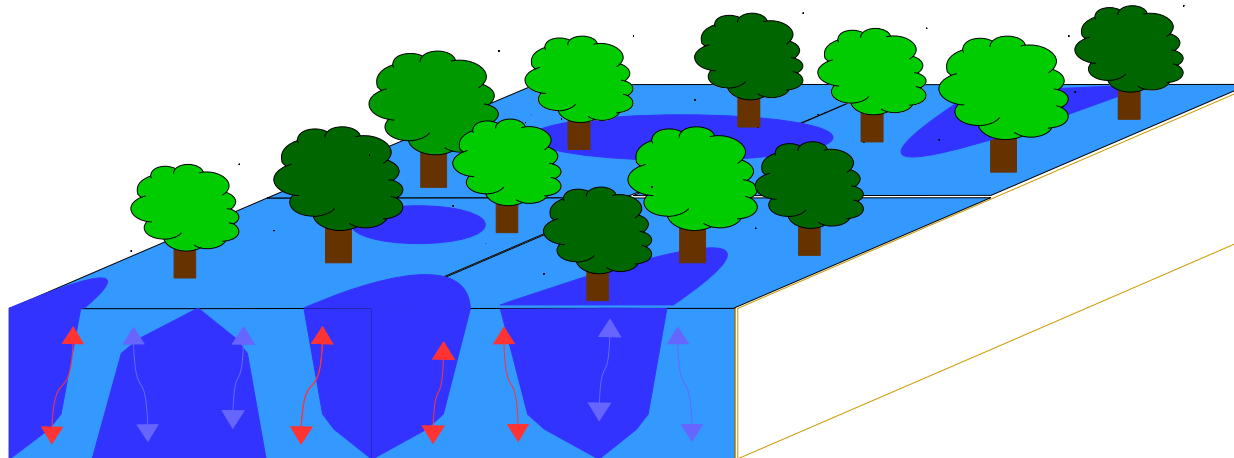
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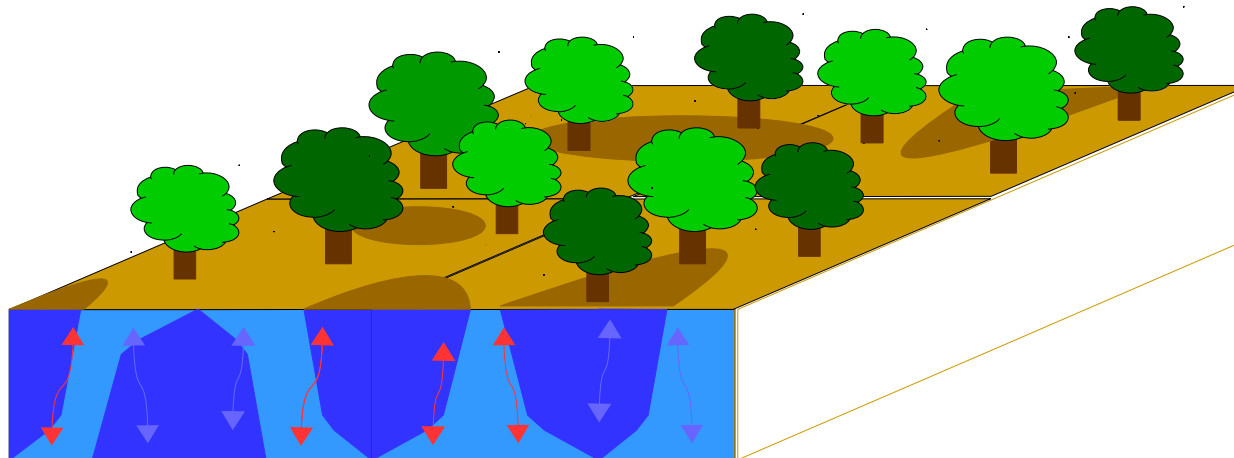
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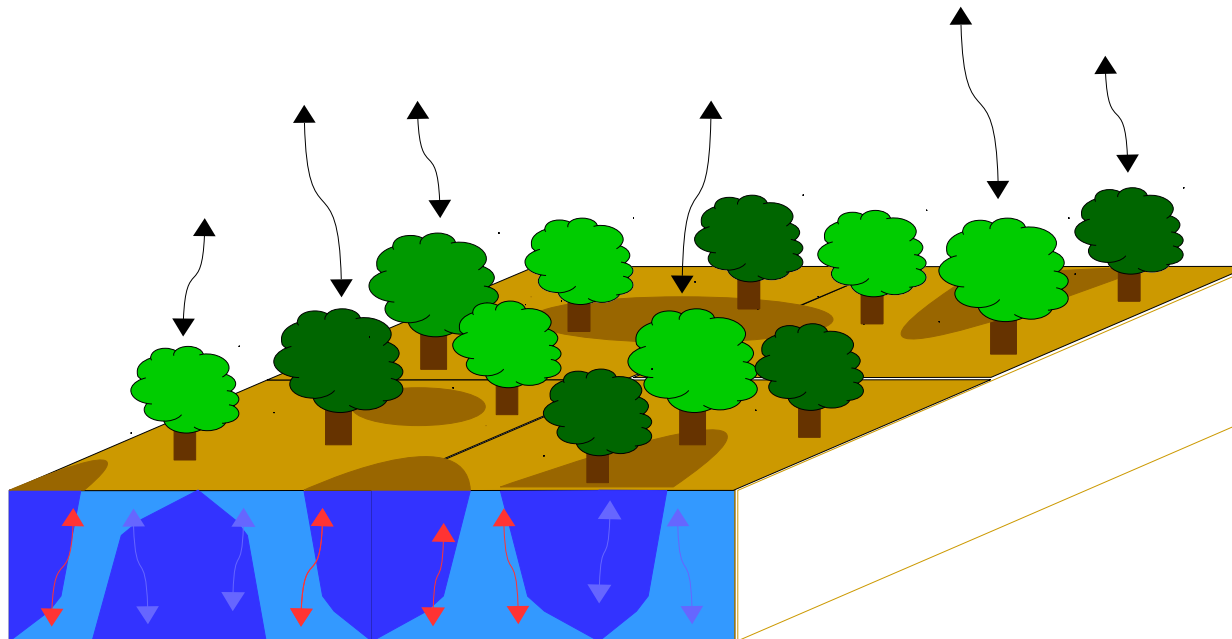
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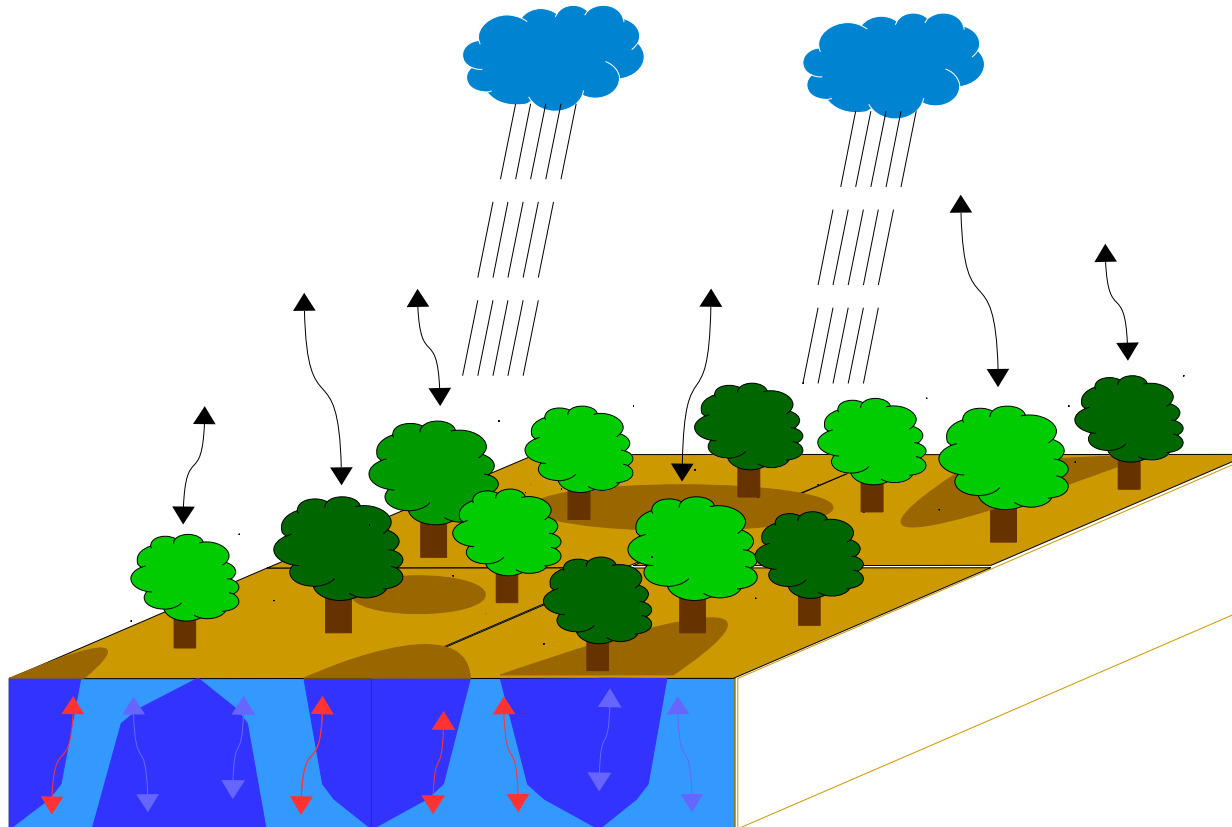
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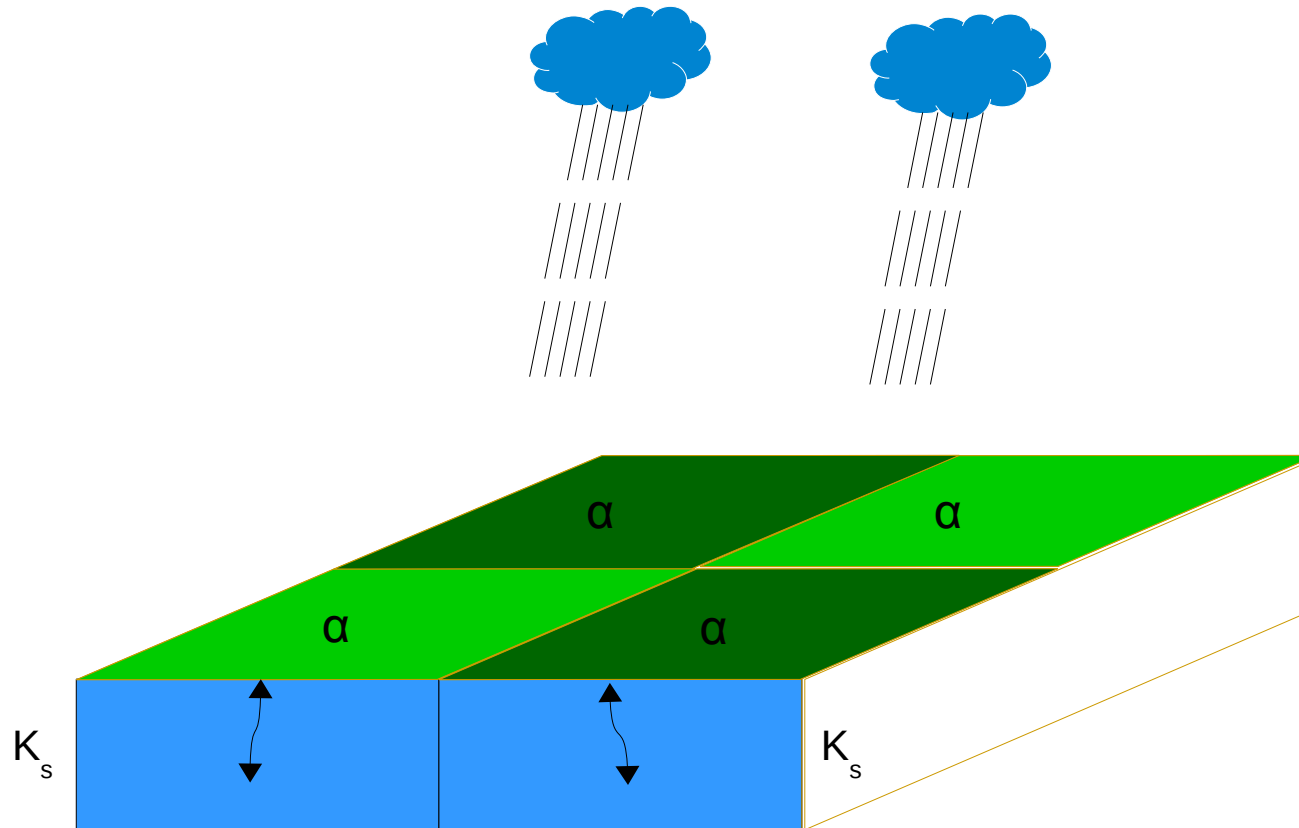
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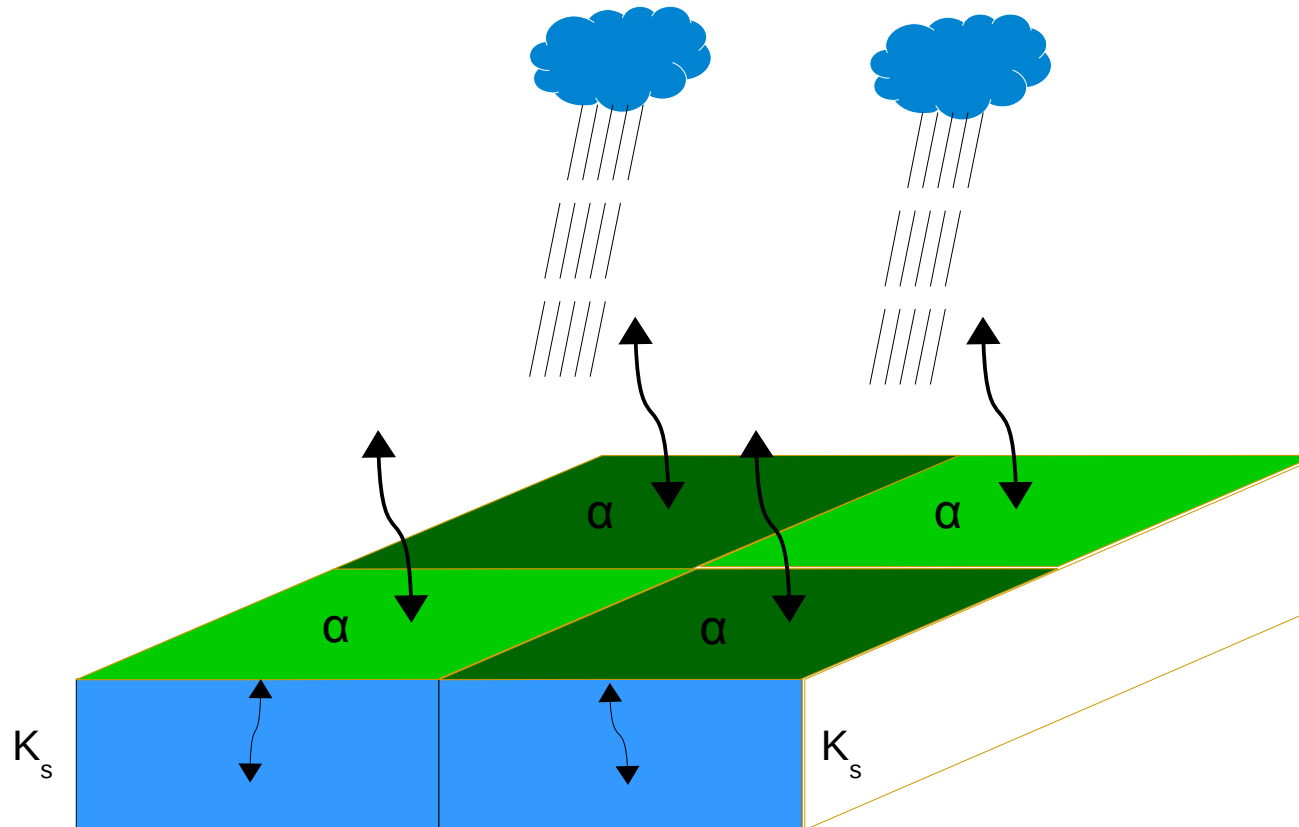
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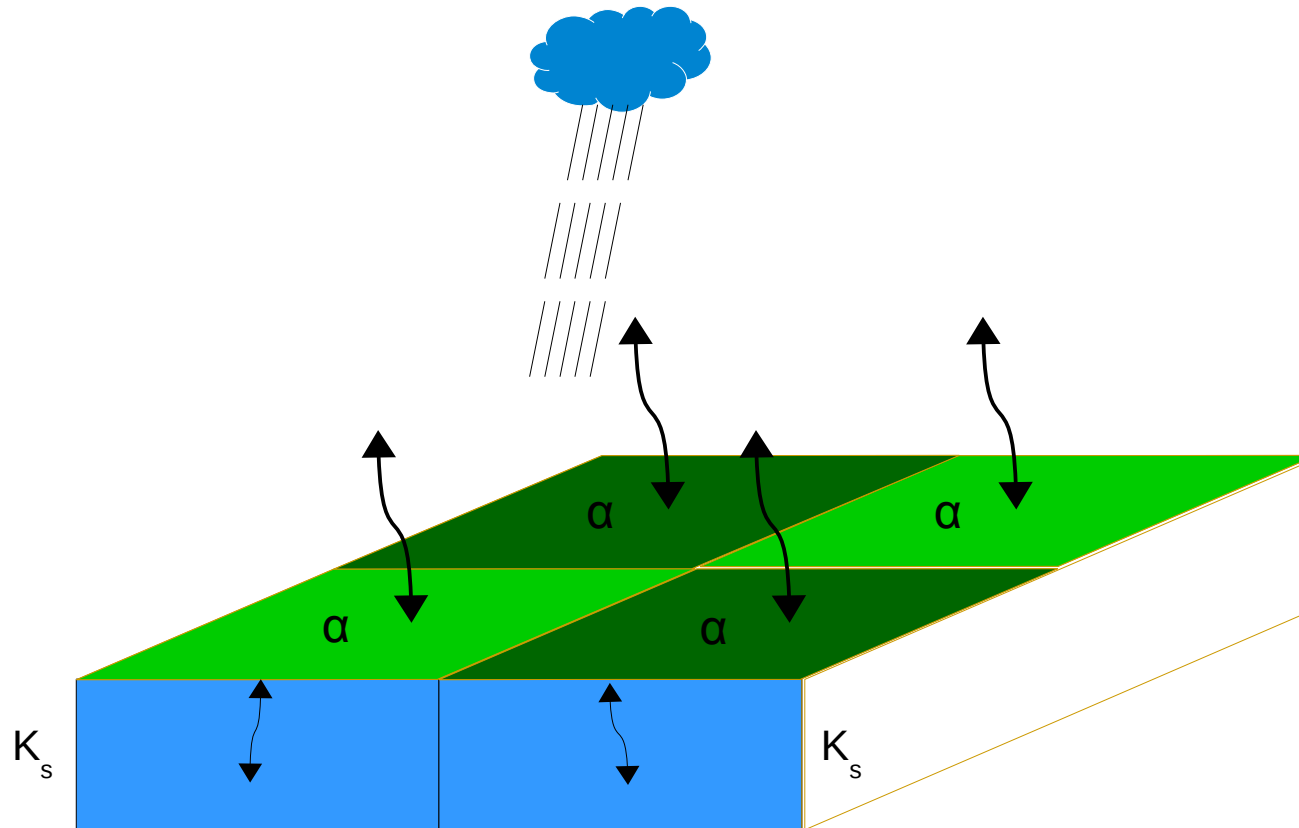
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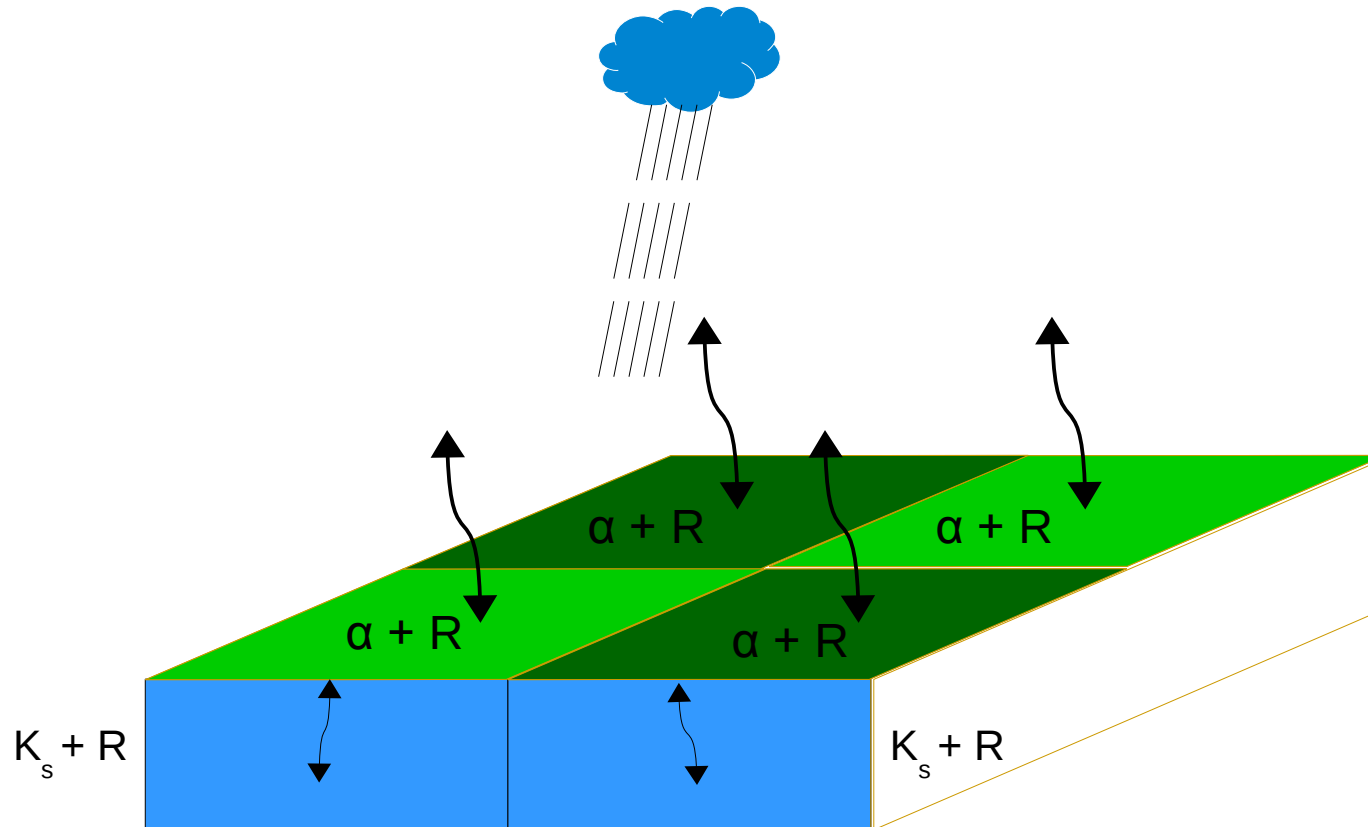
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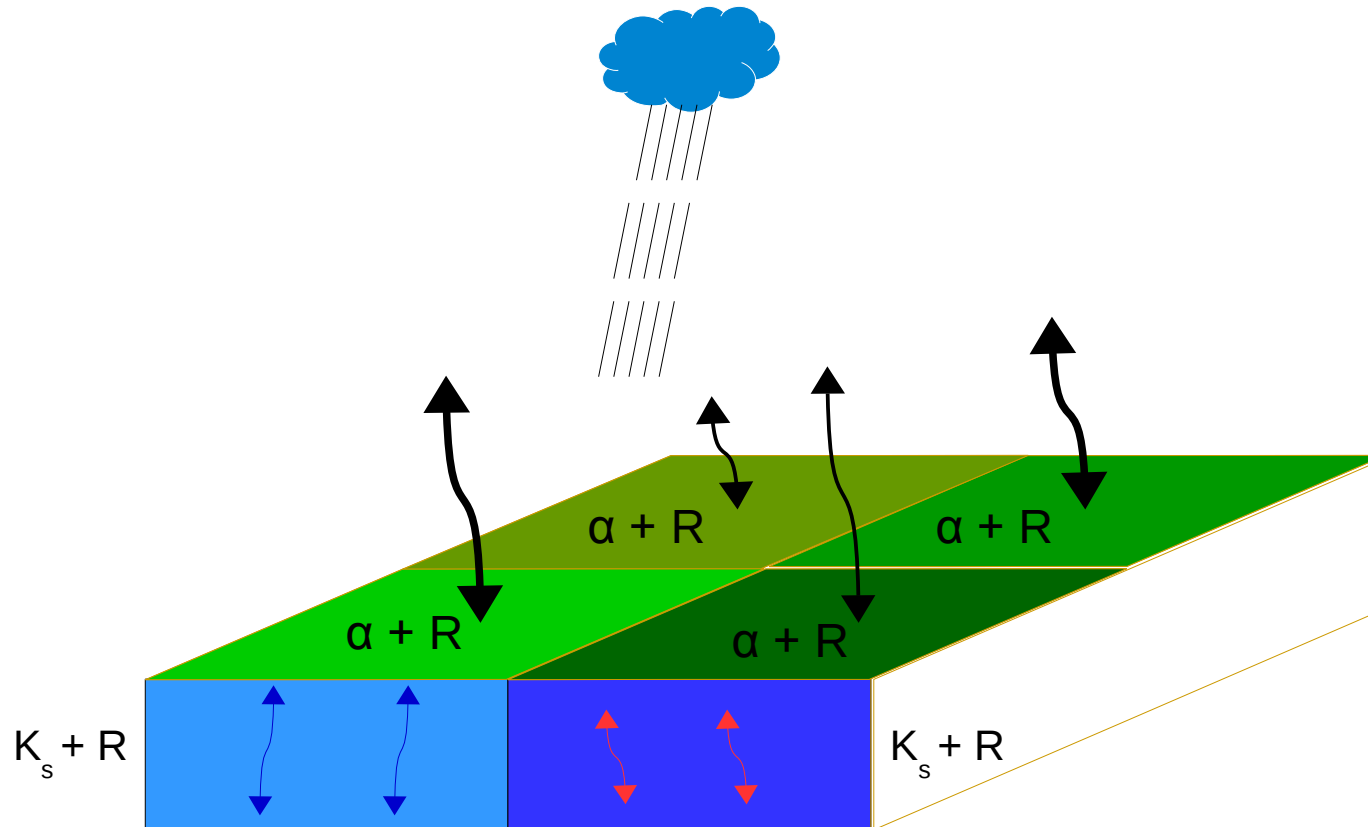
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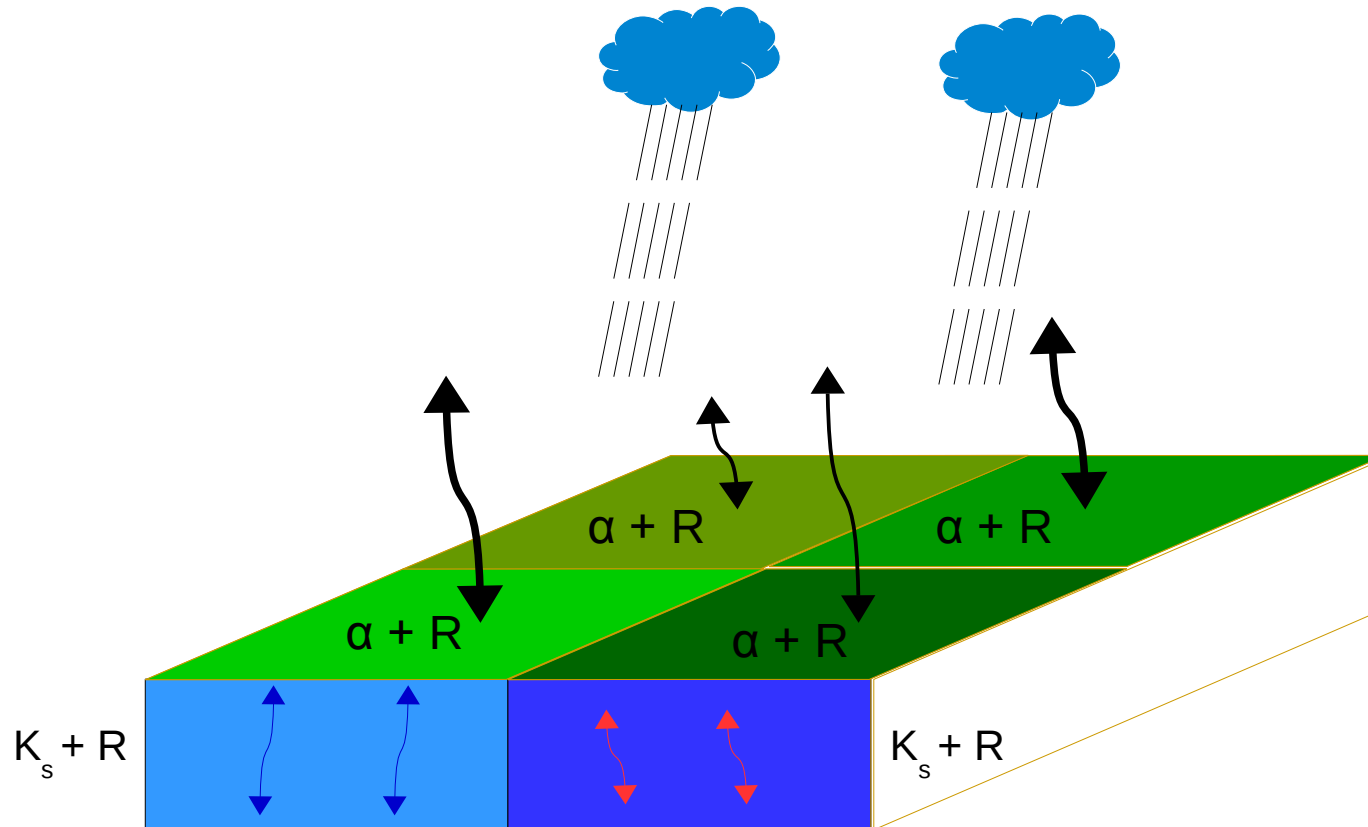
Stochastic Parameterizations



Stochastic Parameterizations



Stochastic Parameterizations



Model Setup

- stochastic approach implemented in VEG3D coupled to COSMO_5.0_clm6

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Model Setup

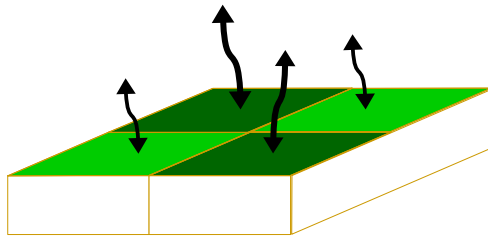
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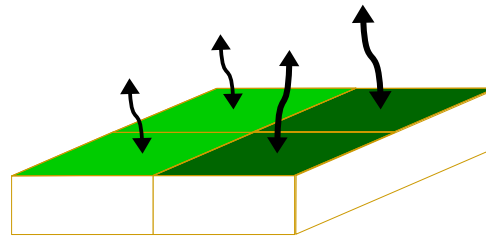
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- coupled simulations for the period 2001-2010, driven by ERA-Interim
- **low impact of frequently changed parameter values on simulation results**

Stochastic Parameterizations

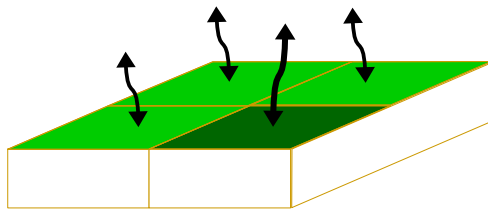
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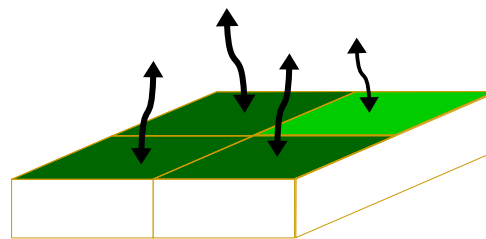
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$(K_s, \alpha) + R_3$

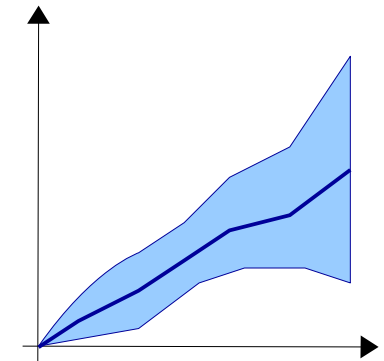


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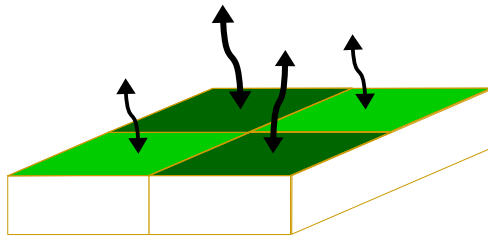
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stochastic VEG3D ensemble

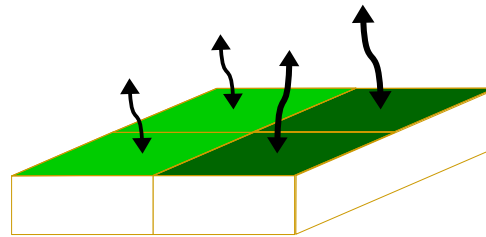


Stochastic Parameterizations

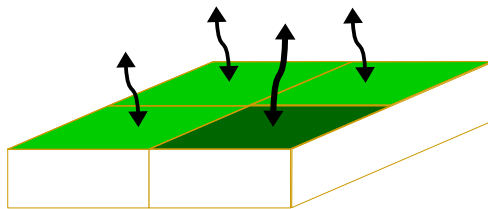
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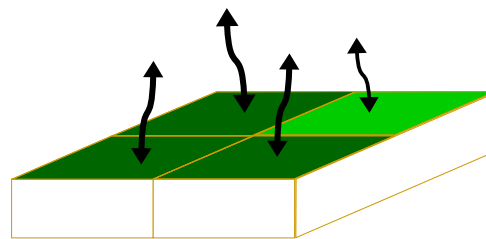
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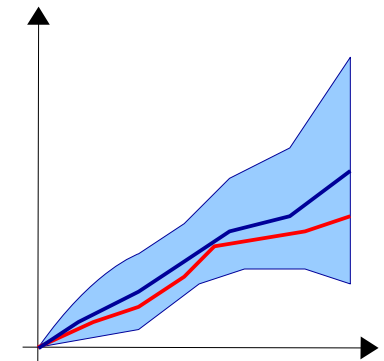


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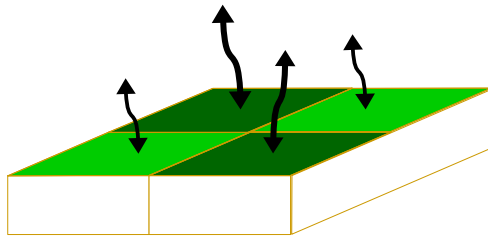
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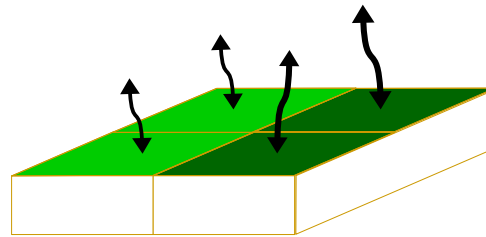


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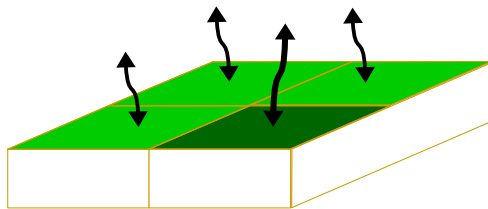
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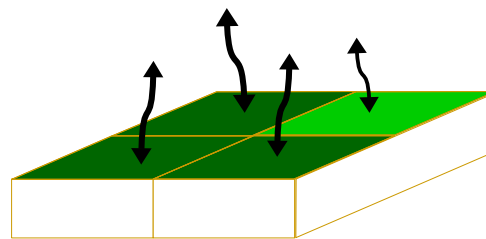
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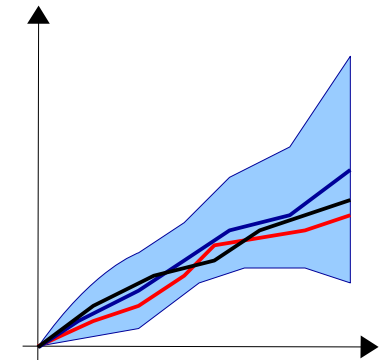


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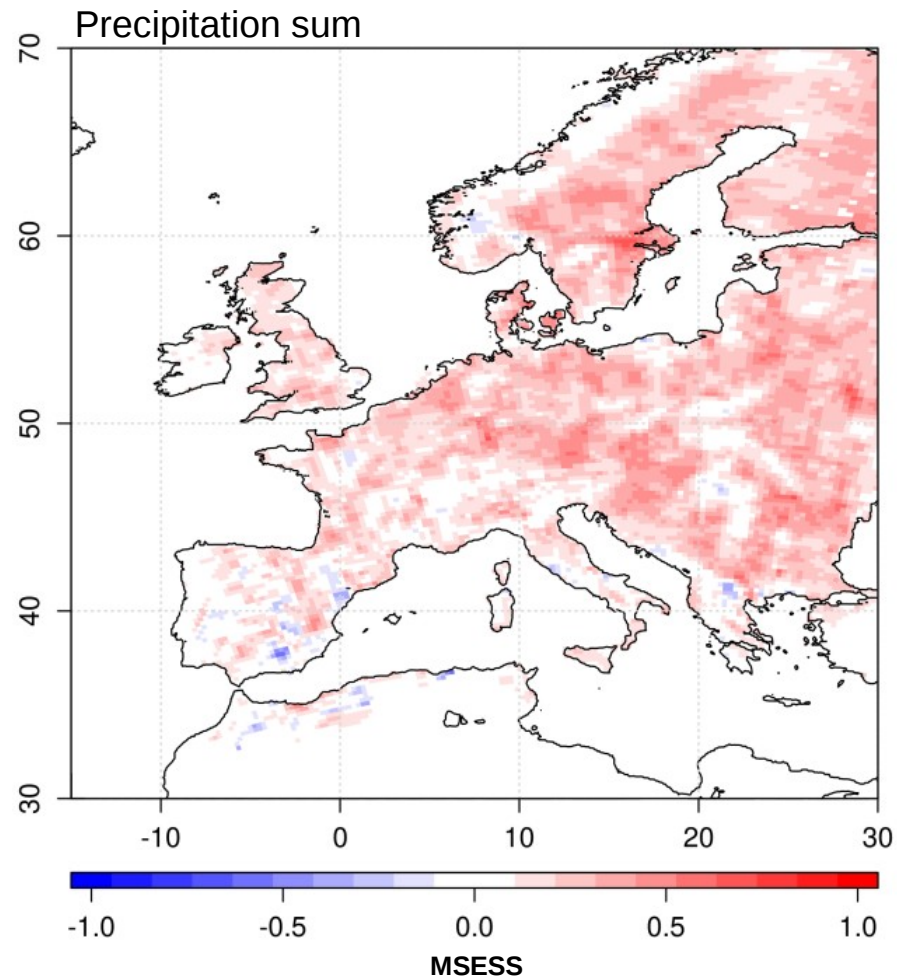
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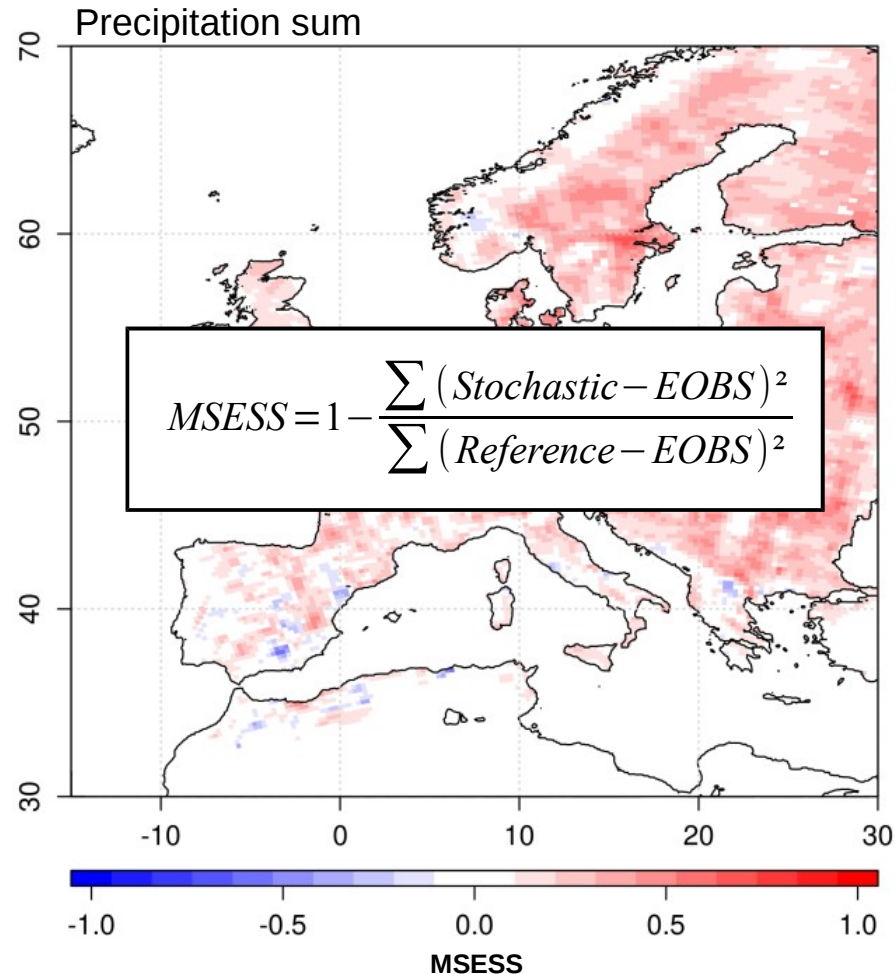
Stochastic Parameterizations

Added value of the stochastic ensemble mean compared to the reference run



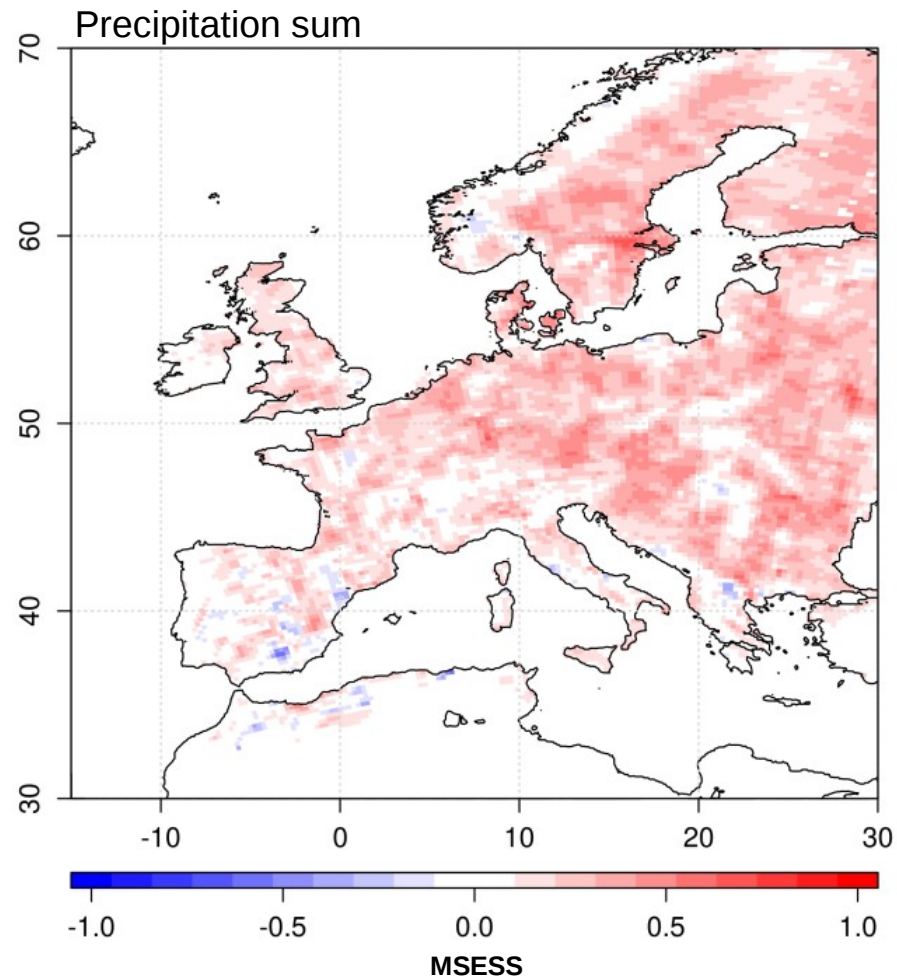
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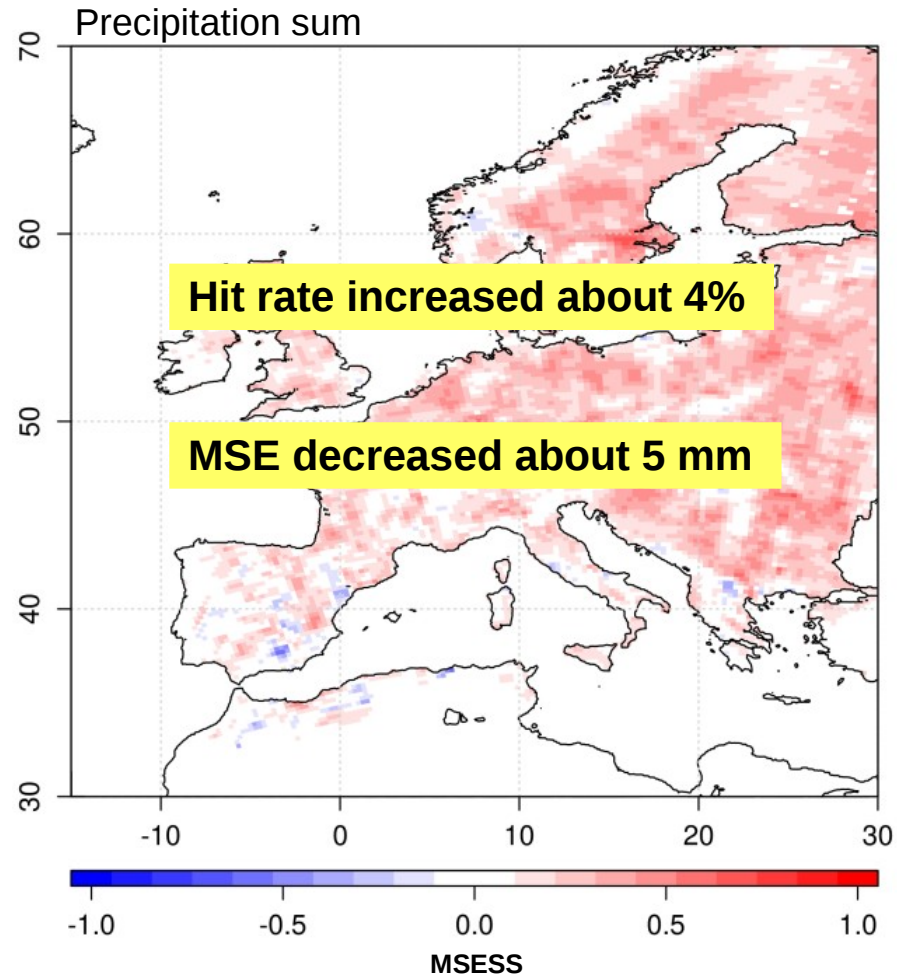
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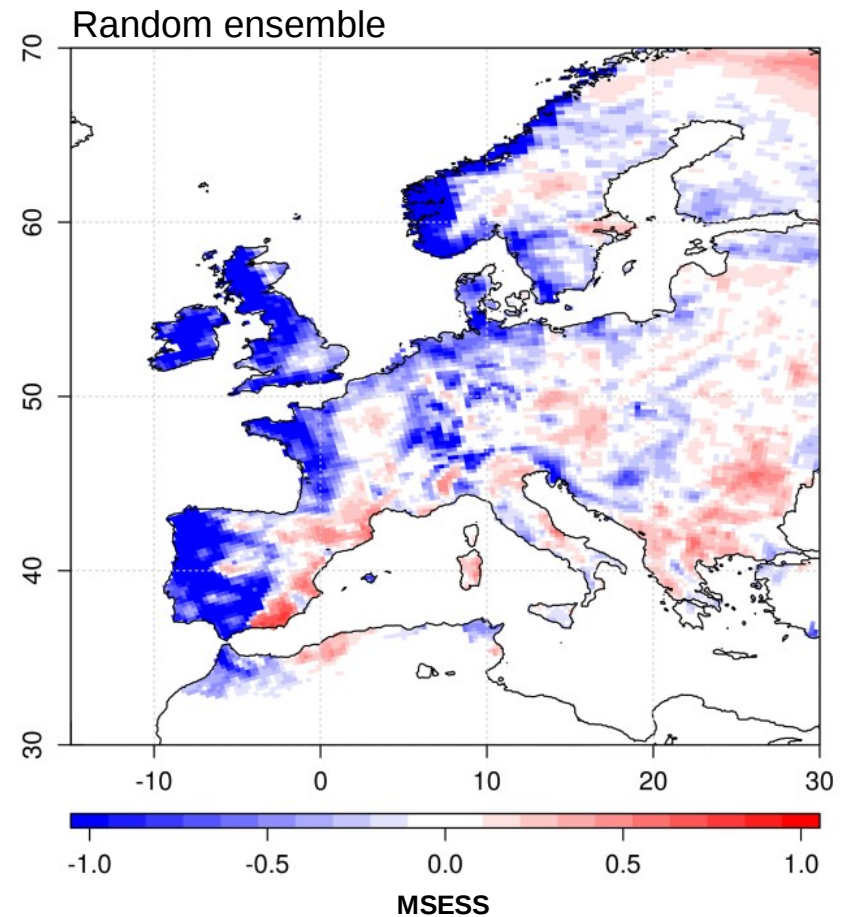
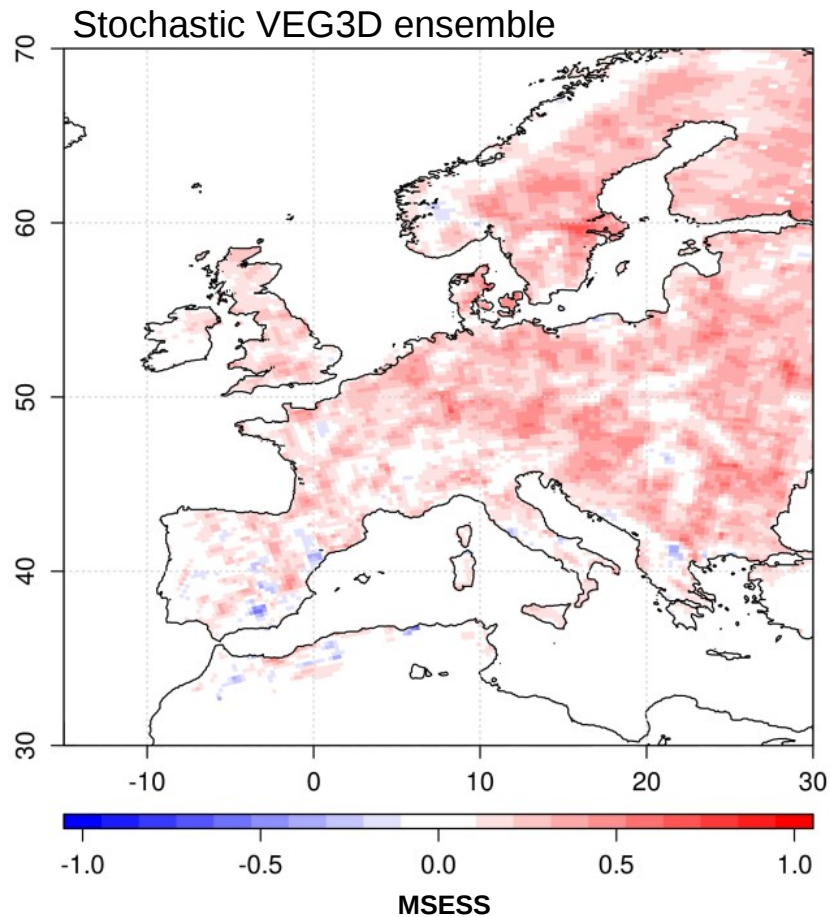
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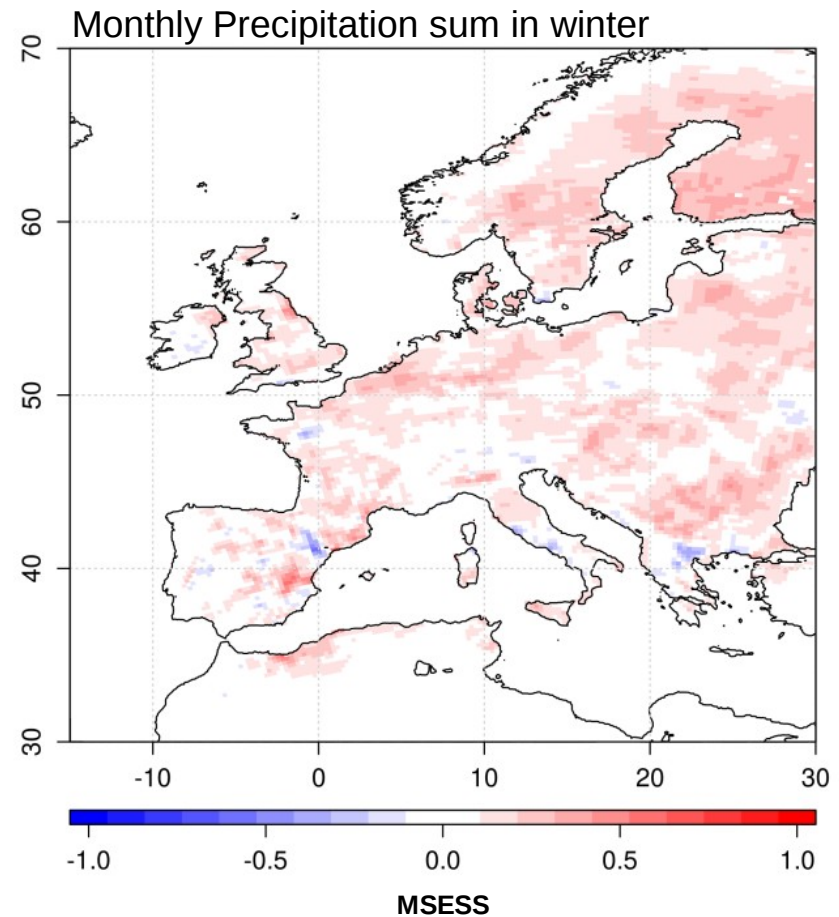
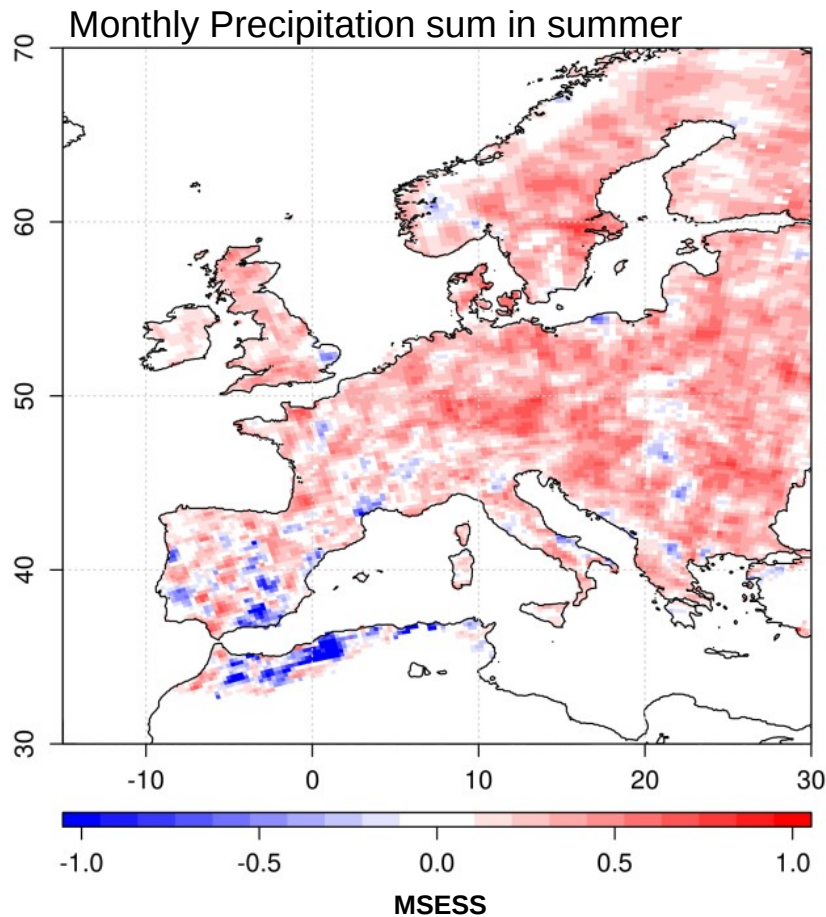
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Summary

- **stochastic soil and vegetation parameterizations implemented in CCLM-VEG3D simulations**
- **stochastic parameterizations improve the representation of precipitation all over Europe**
- **use this stochastic approach for regional decadal predictions in MiKlip**