



PaSim - Pasture Simulation Model

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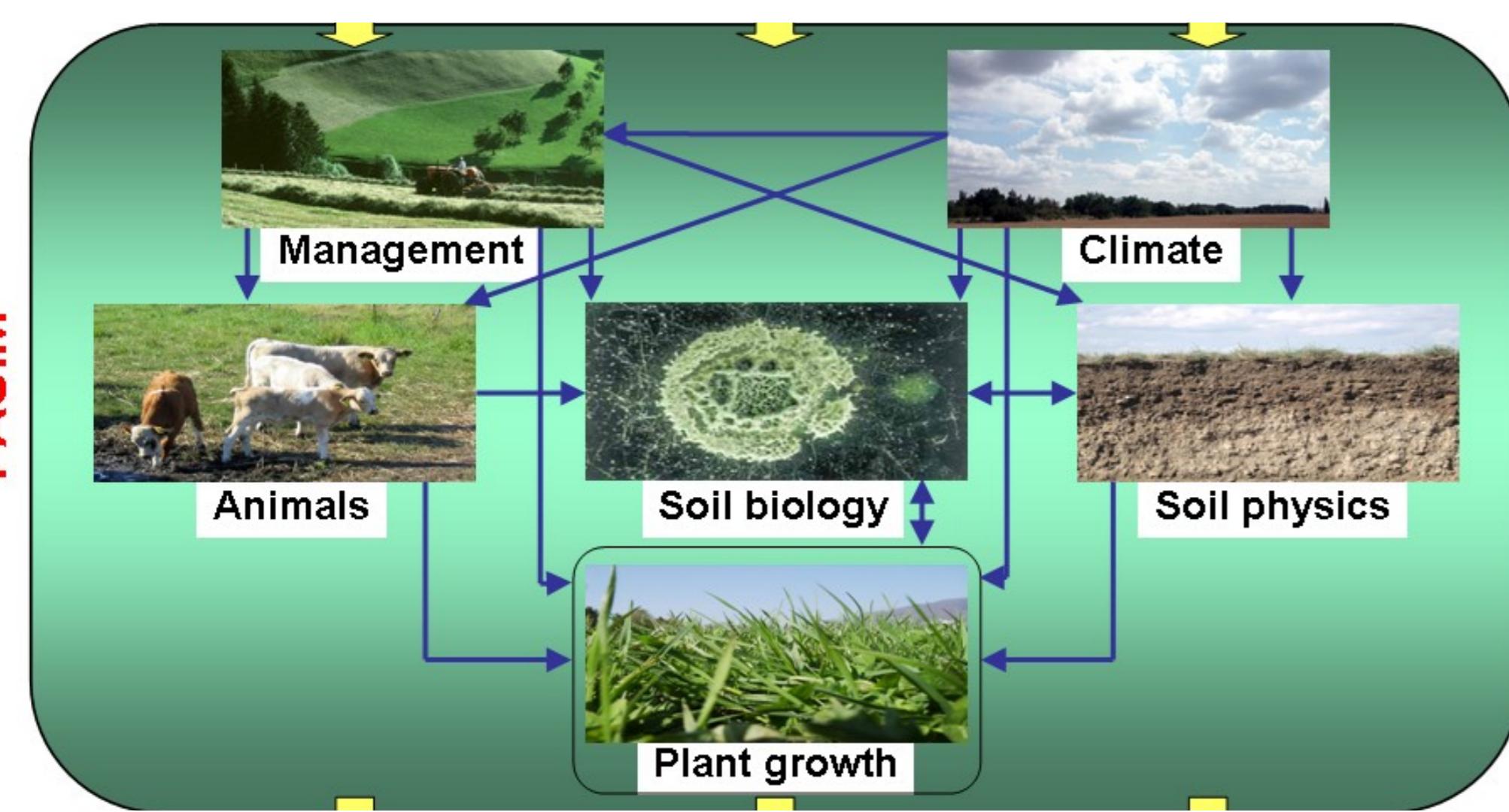
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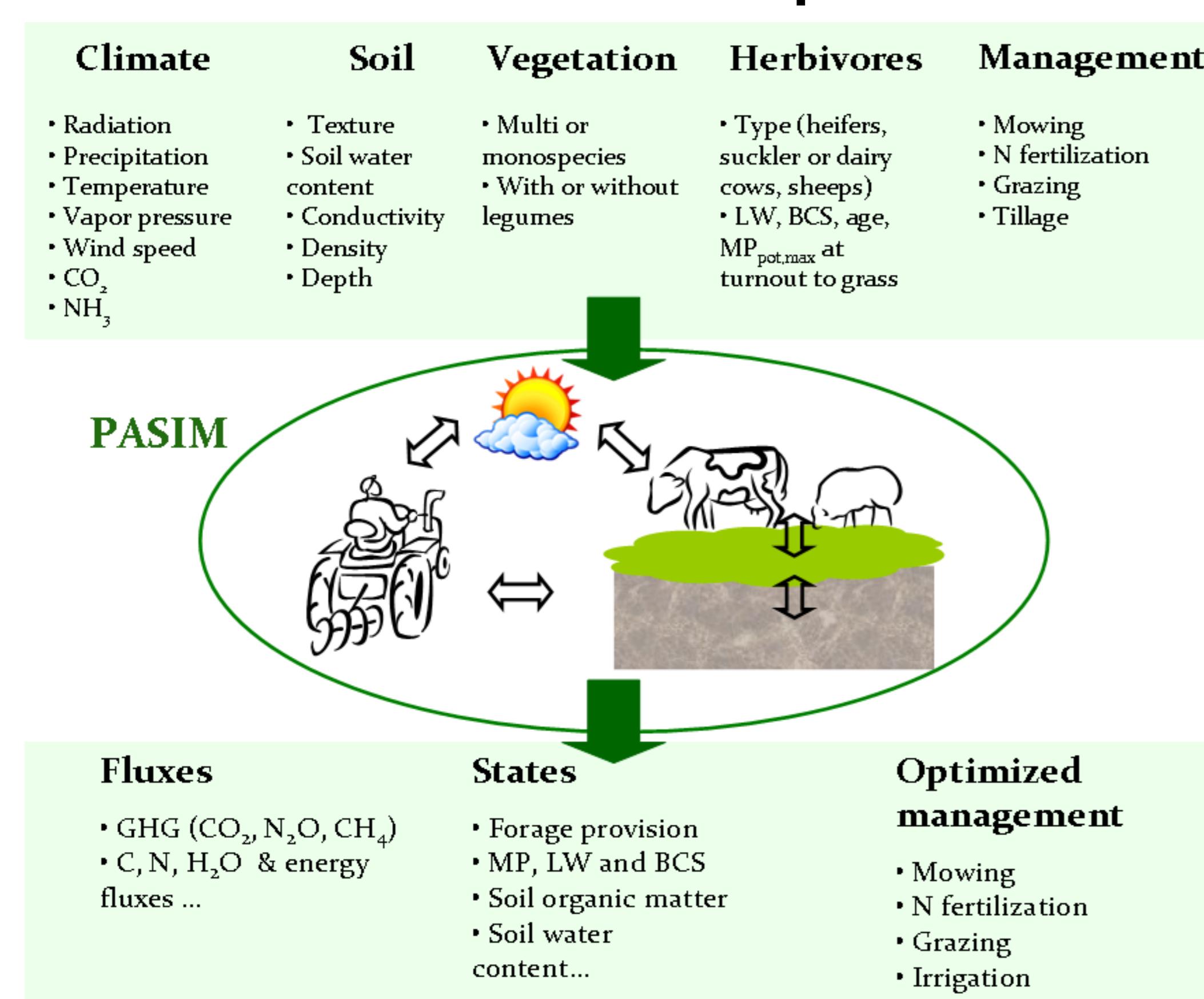
PaSim - Pasture Simulation Model

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<https://www1.clermont.inra.fr/urep/modeles/pasim.htm>

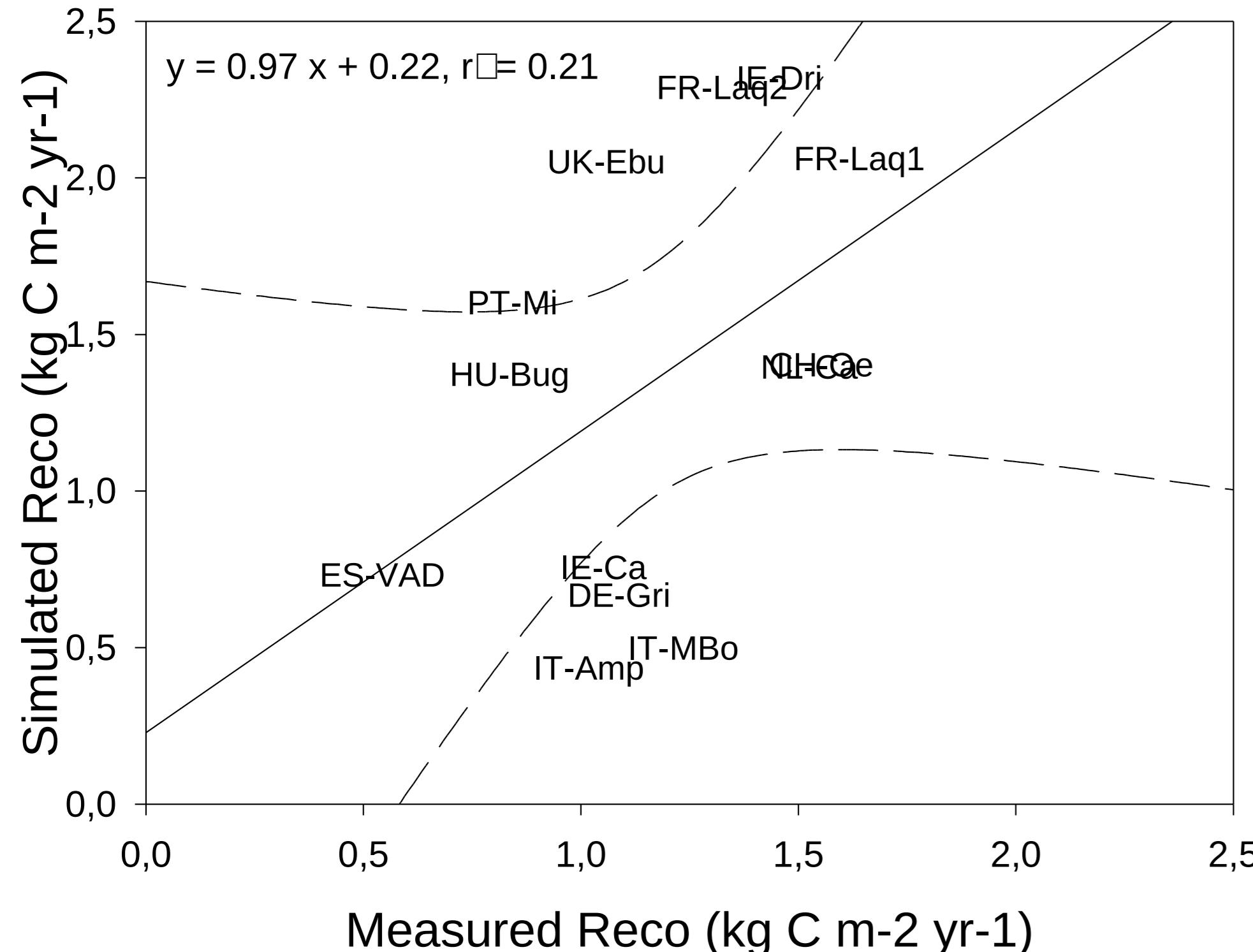
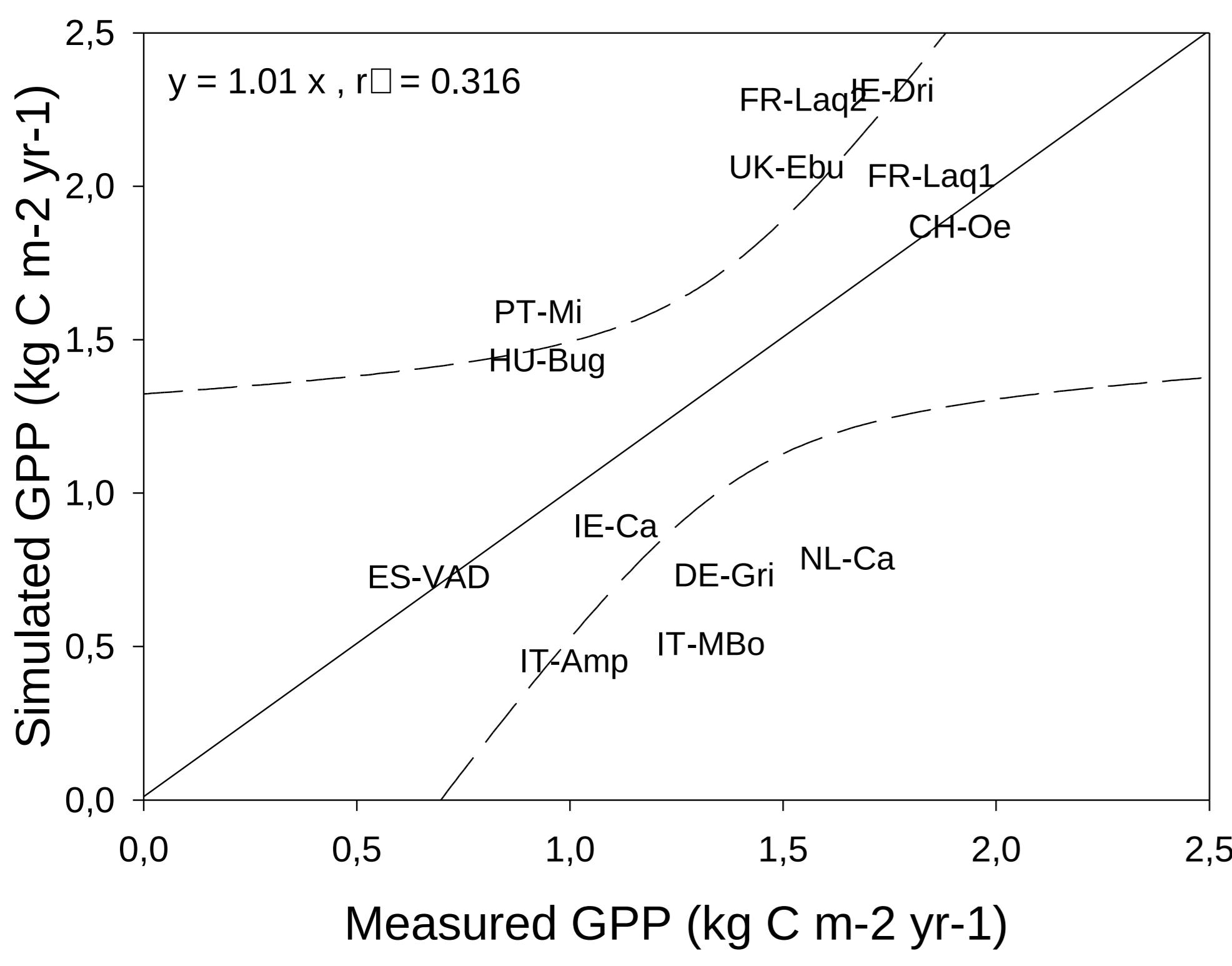
Model structure



Data in- and output



Model validation



Comparison of simulated vs. observed mean annual gross primary productivity (GPP) and ecosystem respiration (Reco) at 13 European grassland sites.

Main properties

- Process-based biogeochemical model (H_2O , C and N cycles)
- System simulated: soil-vegetation-animal-atmosphere
- Short and long term simulations
- Subdaily (hourly) time scale for detailed dynamics and energy budgets stability
- **Plot scale** (upscaling ability)

Accessibility

- Used for **process understanding** rather than decision support
- Graphical user interface
- Software and documentation available for research at <https://www1.clermont.inra.fr/urep/modeles/pasim.htm>

Evaluation/Validation

- **Variables:**
 - Forage yield and quality
 - Greenhouse gas and energy fluxes
 - Soil temperature and water content
 - Animal performance
- **Conditions:** European climate

Usefulness and originality

- Prediction of:
- mechanistically cattle performance
 - biogeochemical cycles of grasslands and their interactions
 - climate changes impacts on livestock systems, and possible adaption options

Project involvement

- National Projects
CLIMATOR, VALIDATE, ORACLE, EPAD
- European projects
GREENGRASS (2003-2005)
CARBOEUROPE (2005-2008)
NITROEUROPE (2007-2011)
CARBO-EXTREME, GHG-EUROPE, ANIMAL CHANGE

Perspectives

- to improve:
- legume dynamics
 - functional plant traits
 - responses to climate change and management
 - grasslands responses to climate and management under **tropical conditions**

PaSim references

- Riedo et al. 1998, 2002 Ecol. Model.
 Schmid et al. 2001 Nutr. Cycl. Agroecosys.
 Vuichard et al. 2007a,b Global Biogeochem. Cy.
 Graux et al. 2011 (submitted to Agricultural Forest and Meteorology)
 Graux et al. 2011 (Agr. Ecosyst. Environ., in press)
 Lardy et al. 2011 (Environmental Modelling and Software, in press)

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