

Main activities of ORCHIDEE-Project

- **Status of the main ORCHIDEE branches**

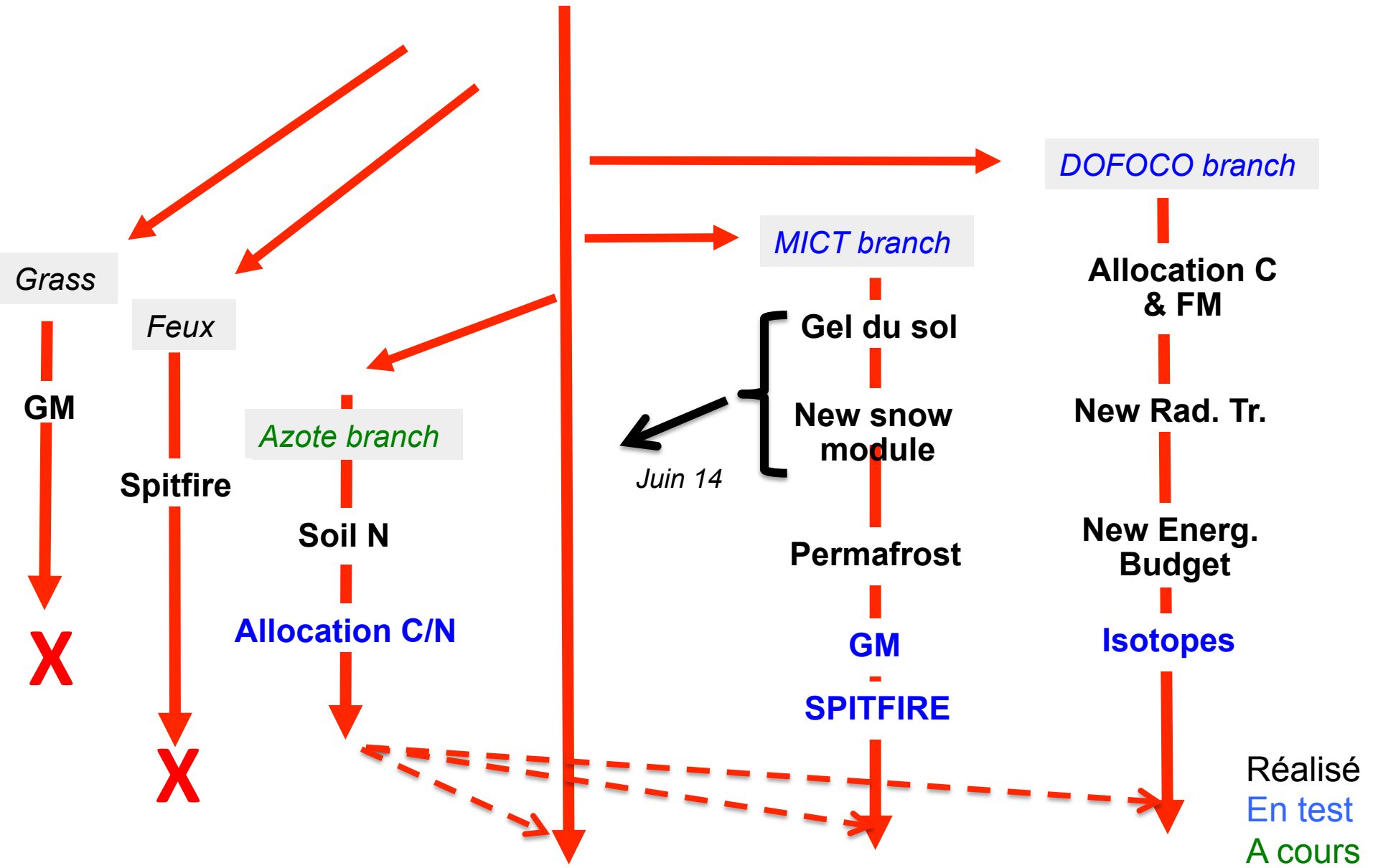
ORCHIDEE-CAN ; ORCHIDEE-Nitrogen; ORCHIDEE - MICT

- **Planning of the « WORK GROUP » in 2014**
 - **CMIP6 Agenda & proposed agenda**
 - **Main road map of the project meeting**
- **ORCHIDEE reference article**
- **« Fair Use Policy » for ORCHIDEE**
 - **Presentation of the proposition**
- **Possible Retreat ?**

Version post - AR5 (1.9.6)

Branches actuelles...

Inclus: Hydro-11C, Spin-up Anal, OMP, Ext param; COV



CMIP6 Agenda

- 2 versions are foreseen (with 2 Physics for LMDz)
- Version 1:
 - Should be ready for Autumn 2015
 - Final adjustment up to early 2016
- Version 2:
 - Ready for early 2017 (shift of 1 to 1,5 yr)
 - Coupling with the new LMDz physic
 - To be prepared in parallele

Dedicated wiki page:

<https://forge.ipsl.jussieu.fr/orchidee/wiki/Meetings/CMIP>

ORCHIDEE: From CMIP5 to CMIP6...

- 11 layers hydrology
- Soil thermics/hydrology with same discretisation
- Soil freezing and multi-layers snow module
- Correction « bug » et « nettoyage » ?
- Fires from SPITFIRE ?
- Temperate crops: winter vs summer wheat ?

Version 1

- Nitrogen cycle
- Grassland Management
- Updated Dynamic vegetation (DGVM)
- Soil Carbon Permafrost model

V1 or V2 ?

- 2 streams RT & Albedo
- Forest management & new carbon allocation
- Hydraulic lift of water within plants
- New soil Carbon vertically discretized model ?
- Global crop model (wheat, maize, rice, ...) ?
- Phosphorus cycle and impact on C cycle ?

Version 2

« Working GROUP » and Agenda for 2015

Specific ongoing action on model Evaluation / Validation

Working group on the Energy and Water balances :

- Include new common vertical discretization for soil thermic and hydrology (Fuxing)
- Fine tune the new snow module to have a fully implicit scheme (Tao)
- Include new calculation of soil thermal properties (Fuxing)

Working group on Biogeochemistry: Nitrogen cycle

- Nitrogen cycle implementation in parallele in TRUNC, ORC-CAN and MICT for the coupling with Phosphorus
- Action pilot by Nicolas Vuichard

→ Dedicated wiki page set up (

<https://forge.ipsl.jussieu.fr/orchidee/wiki/Meetings/CMIP6>)

to see:

- Proposed agenda & follow the achievements

Evaluation / Validation

- Global CHECK
 - Energy, water, carbon conservation !
- Global comparison (data streams):
 - Carbone, water and energy cycles
 - List of the product that will be used under:
<https://forge.ipsl.jussieu.fr/orchidee/wiki/Meetings/CMIP6>: (see specific document)
- Tool for model evaluation
 - A dedicated meeting will be proposed...

Fair use policy ?

- 1) Protect model developers of new scientific modules (in particular CDDs)
- 2) Protect “overall” model contributors : code maintenance, drivers preparation, user-help, validation tool, fixing bugs ... (overall model life..)
- 3) Protect from too much “internal competition”; to keep some “scientific space” for everyone..

Use LSCE cloud to support policy..

- [https://files.lsce.ipsl.fr/index.php/apps/files?dir=/Shared/ORCHIDEE/FairUse %26 ARTICLES](https://files.lsce.ipsl.fr/index.php/apps/files?dir=/Shared/ORCHIDEE/FairUse%26ARTICLES)
- ARTICLE_IN_PREP: directory with all articles..
- INTENDED_STUDIES.doc
- MODEL_FUNCTIONALITIES.doc

Model functionalities

FUNCTIONALITY	REFERENCES	ORC VERSIONS	MAIN CONTACT POINTS	CONTRIBUTORS	STATUS (from restricted to free)
New soil temperature and hydrology discretization		??	Fuxing Wang, Frederic Cheruy	Jean Louis Dufresne, ??	
Multi-layer soil hydrology	De Rosnay et al. 2002 de Rosnay et al. 2000 d'Orgeval et al. 2008 Campoy et al. 2013	TRUNK ORC-CAN ORC-MICT	Agnes Ducharne, Jan Polcher	de Rosnay, d'Orgeval, Guimberteau, Campoy, Cheruy, Wang, Ghattas	free
Routing	Ngo-Duc et al. 2007 Guimberteau et al. 2012	TRUNK	Jan Polcher, Matthieu Guimberteau,	Ngo-Duc, Ducharne	
Soil freezing	Gouttevin et al., 2012	TRUNK ORC-MICT	Gherard Krinner	Gherard Krinner, ?? Isabelle Gouttevin	
Permafrost carbon	Koven	ORC-MICT			
New snow multi-layer module	Wang et al., 2013	TRUNK ORC-MICT	Tao Wang	Catherine Ottlé, Philippe Ciais, ??	
Two way radiation transfer model for albedo	Otto et al 2014, Naudts et al 2014 and McGrath et al 2014	ORC-CAN			
Hydraulic architecture of plants	Naudts et al 2014	ORC-CAN			
Multi-layer energy budget	Ryder et al 2014 Naudts et al 2014	ORC-CAN			
Allometric based	Naudts et al 2014	ORC-CAN			

Intended studies

Holders	Objectives	ORCHIDEE version and features	Period
Ducharne	GEM projects to develop a parametrization of groundwater in ORCHIDEE and understand groundwater impacts on climate	ORC-TRUNK, multi-layer soil hydrology, routing	2014-2018
Guenet	Effect of priming on the global carbon stock	ORCHIDEE-SOM	2015-2017
Guenet	Estimation of the lateral flux of DOC over Europe	ORCHIDEE-SOM	2015-2018
Guenet	Sensitivity analysis of different function representing soil moisture and temperature effect on the soil C stock dynamic	ORCHIDEE-SOM	2015-2018
Peylin and several collaborators	Investigate the potential of Satellite and in situ observations of the carbon (NDVI, FluxNet, CO ₂ , biomass) and water cycle (Soil Humidity) to constrain simultaneously the main ORC parameters	ORCHIDEE-TRUNK And ORCHIDEE-CAN	2015-2018
Peylin and collaborators	Simulate tree ring width, 13C and 18O and use existing chronologies to constrain ORC tree growth and look at WUE and soil hydric stress	ORCHIDEE-CAN	2015-2016
Ottlé et al.,	Evaluation of ORCHIDEE-MICT on instrumented sites and on Siberia	ORCHIDEE-MICT	2014-2017
Ottlé et al.,	Climate change impacts on Siberian hydrology	ORCHIDEE-MICT + ISBA	2015-2017

Articles in preparation

TITLE	CO-AUTHORS	ORCHIDEE FUNCTIONALITIES and LEVEL OF CONTRIBUTION of ORCHIDEE.	FILE NAME of the DRAFT
Comparing two soil hydrology schemes in ORCHIDEE	Ducharne, Guimberteau, Polcher, Vuichard, Cheruy, Ghattas	ORC-Trunk + multi-layer soil hydrology scheme; level of contribution = scentral	No draft yet
Testing ORCHIDEE capability to simulate tundra ecosystems in Arctic environments: Sensitivity analysis and model calibration	S. Dantec-Nédélec, Ottlé, C., Wang, T., Guglielmo, F., Maignan, F., Delbart, N., Valdayskikh, V., Radchenko, T., Nekrasova, O., Zakharov, V., Jouzel, J.,	ORCHIDEE-MICT	Draft available
Land surface models simulating hydrology in western Siberia: what do we learn from water isotopes?	F. Guglielmo, C. Risi, C. Ottlé, V. Valdayskikh, O. Nekrasova, O. Stukova, O. Cattani, ...V. Zakharov, J. Jouzel	ORCHIDEE-MICT-ISO	Draft available

New Reference Article

- New reference ORCHIDEE article (to replace Krinner et al. 2005)
- Collective effort :
 - Description of the TRUNC (current version)
 - Last version accessible under:
<https://files.lsce.ipsl.fr/index.php/apps/files?dir=/Shared/ORCHIDEE/PUBLICATIONS/ARTICLE-Reference-2014>
 - Description of Physics and Biogeochemistry
 - Emphasize on the model evaluation
 - Fluxnet site:
 - Global forced simulation :
 - Global LMDzOR :

Past / ongoing actions...

- Coding Guidelines : OK
- XIO new output module : implemented
- Parallelization : OMP done
- Version LMDz-zoom Europe – ORC : Working
- Several reference simulations (MIP): TRENDY, MsTMIP,...
- Protocol for model evaluation: Done

- New Logo : in progress
- Re-organisation of the WIKI web site : any suggestions ?

Next retreat

- “Restricted retreat” with JULES core developpers
 - Jules retreat: 30 Juin – 1 Juil
 - => common meeting the 2 et 3 Juil
 - Objectives: Exchange on Validation tools and possible join parameterizations..
- Standard ORC retreat (DEV group)
 - Cleaning of the code (following coding guide lines)
 - Specific work on model outputs (units, names,...)
 - Any suggestions are welcome ?