

## The INCA model

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## 1. Introduction

INCA (INteraction with Chemistry and Aerosols) is a chemistry and aerosol model coupled to the Laboratoire de Meteorologie Dynamique (LMD) General Circulation Model, LMDz. INCA is developed at the Laboratoire des Sciences du Climat et de l'Environnement (LSCE) in collaboration with other laboratories within IPSL.

LMDzINCA accounts for emissions, transport (resolved and sub-grid scale), photochemical transformations, and scavenging (dry deposition and washout) of chemical species and aerosols interactively in the GCM. Several versions of the INCA model are currently used depending on the envisaged applications with the chemistry-climate model. The standard model resolution is 96x95 (3.75° longitude x 1.9° latitude) and 144x142 (2.5° longitude x 1.3° latitude). There are two standard vertical resolutions includes 39 and 79 sigma-p hybrid levels. The model can be run in a nudged mode, relaxing to ECMWF winds and temperature.

LMDz-INCA constitutes the atmospheric component of the IPSL coupled atmosphere-ocean-biosphere model and is coupled to the ORCHIDEE biosphere model in order to determine interactively the exchange of chemical species (emissions, deposition) between the atmosphere and the surface.

## 2. INCA

Inca model is always use coupled with LMDZ and ORCHIDEE models. To have more informations on how compile and launch a simulation you can read [this documentation](#)

## 3. Pass word

Send an email to Anne Cozic to obtain the pass word of Inca model

## 4. Chemistry configurations

The INCA model offers different chemistry configurations:

- NMHC : methane chemistry and non methane chemistry
- AER : aerosols only using a prescribed chemistry
- NMHC\_AER : methane chemistry and non methane chemistry + aerosols
- NMHC\_AER\_S : version NMHC\_AER + stratospheric chemistry
- GES : greenhouse gases
- DUSS : dust and seasalt version