

Actividad 2. Acción 2.2.

Formación en Modelización Climática con WRF

Weather/Climate modeling with WRF

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Duration: 20 h

Contents

- 1. A brief introduction to the High Resolution Weather Modeling (1.5 h)**
 - a. Understanding models: GCMs vs RCMs
 - b. The concept of Downscaling: Enhancing the resolution of the phenomena
 - c. High Performance Computing Systems
 - d. File formats for Weather and Climate data
- 2. An overview of the WRF Modeling System (2 h)**
 - a. Fundamentals of WRF: What is WRF? Who uses WRF? What are their applications? The scope of WRF
 - b. The structure of WRF: Components, Application and Data flowcharts
 - c. Domains, nesting and data assimilation
 - d. Key features of the ARW core
 - e. Software requirements
- 3. Installing WRF and WPS (2.5 h)**
 - a. System requirements
 - b. Installing libraries
 - c. Download source data
 - d. Download datasets
 - e. Compiling WRFV3
 - f. Compiling WPS
- 4. WPS: The WRF Preprocessor System (4 h)**
 - a. The purpose of WPS
 - b. The flowchart of WPS
 - c. First step: geogrid
 - i. Features of geogrid
 - ii. How to define model domains: geographical projections, nested domains
 - iii. Interpolation options
 - iv. The geogrid.tbl file
 - v. Output files
 - d. Second step: ungrib
 - i. Features of ungrib
 - ii. Vtables
 - iii. Intermediate file format
 - iv. Output files

1

- e. Third step: metgrid
 - i. Features of metgrid
 - ii. Grid staggering
 - iii. Interpolation options
 - iv. Output files
 - f. All-in-one: The namelist.wps file
- 5. Case studies with WPS (2 h)**
- a. Designing a brief forecast over Morocco
 - b. Preparing the study of a small historical period.
- 6. ARW: The WRF Model Execution System (4 h)**
- a. The purpose of ARW
 - b. The ARW numerical core
 - c. Parameterizations
 - i. Radiation schemes
 - ii. Cumulus schemes
 - iii. PBL schemes
 - iv. Surface schemes
 - v. Microphysics schemes
 - d. Nudging boundary conditions
 - e. Nesting domains
 - f. The REGISTRY.EM file
 - g. Setup and run
 - i. The namelist.wrf file
 - ii. Preparing boundaries: real.exe
 - iii. Launching the model: wrf.exe
 - iv. Typical failures in the setup-run process
- 7. Case studies with WRF (3 h)**
- a. Running a brief forecast over Morocco
 - b. Running a small historical period analysis
 - c. Viewing the results obtained
 - i. Using VAPOR
 - ii. Using ncview
 - iii. Using NCL
- 8. Helping the schedule of simulations: a brief overview of the tool WRF4G (1 h)**
- a. An introduction of WRF4G
 - b. Requirements of WRF4G
 - c. Namelist files in WRF4G
 - d. Running WRF4G

Requisitos obligatorios del curso

- Conocimientos de Unix/Linux a nivel de usuario medio (Manejo bajo shell)
- Inglés/Castellano

Requisitos valorables del curso

- Nociones de supercomputación

- Nociones de modelización atmosférica

