Iberian Peninsula Re-analysis (IPRA)

Jesús Fernández (UNICAN)

g09 · Asimilacion de datos

Jon Sáenz (EHU) et al.

g38 · Acoplamiento con modelo de suelo

Juan Pedro Montávez (UM) et al.

- Coordinated project funded by the spanish ministry of education and science.
  - g13 – CIEMAT. Centro de Inv. Energéticas, Medioambientales y Tec.
  - g33 – UC. Univ. de Cantabria
  - g26 – UCM. Univ. Complutense de Madrid
  - g38 – UM. Univ. de Murcia
  - – UPM. Univ. Politécnica de Madrid
  - g09 – UPV. Univ. del País Vasco

Estudio de la predictibilidad meteorológica aplicada a la gestión de recursos eólicos en terreno complejo.

- corto y medio plazo (hasta 48-72 horas) y estacional (hasta 1 mes)
- multiples metodologías para la estimación de la producción de energía eólica
  - **Downscaling dinamico** (salidas para modelos de viento de microescala y potencia)
  - **Downscaling estadistico** (a variables meteorologicas y de potencia)
- Análisis del valor económico de cada metodología desde el punto de vista de su integración en el sistema de gestión eléctrica.

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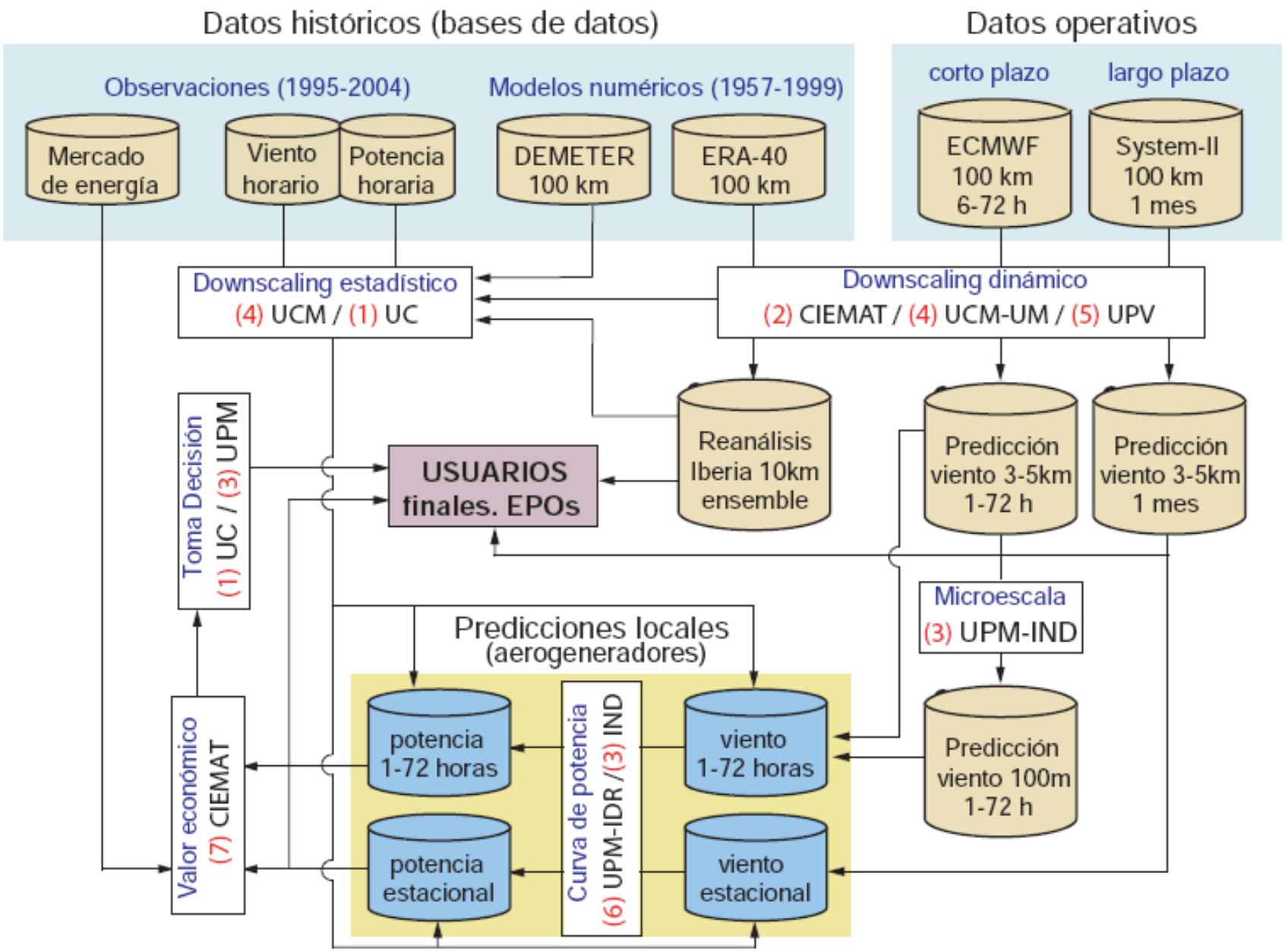

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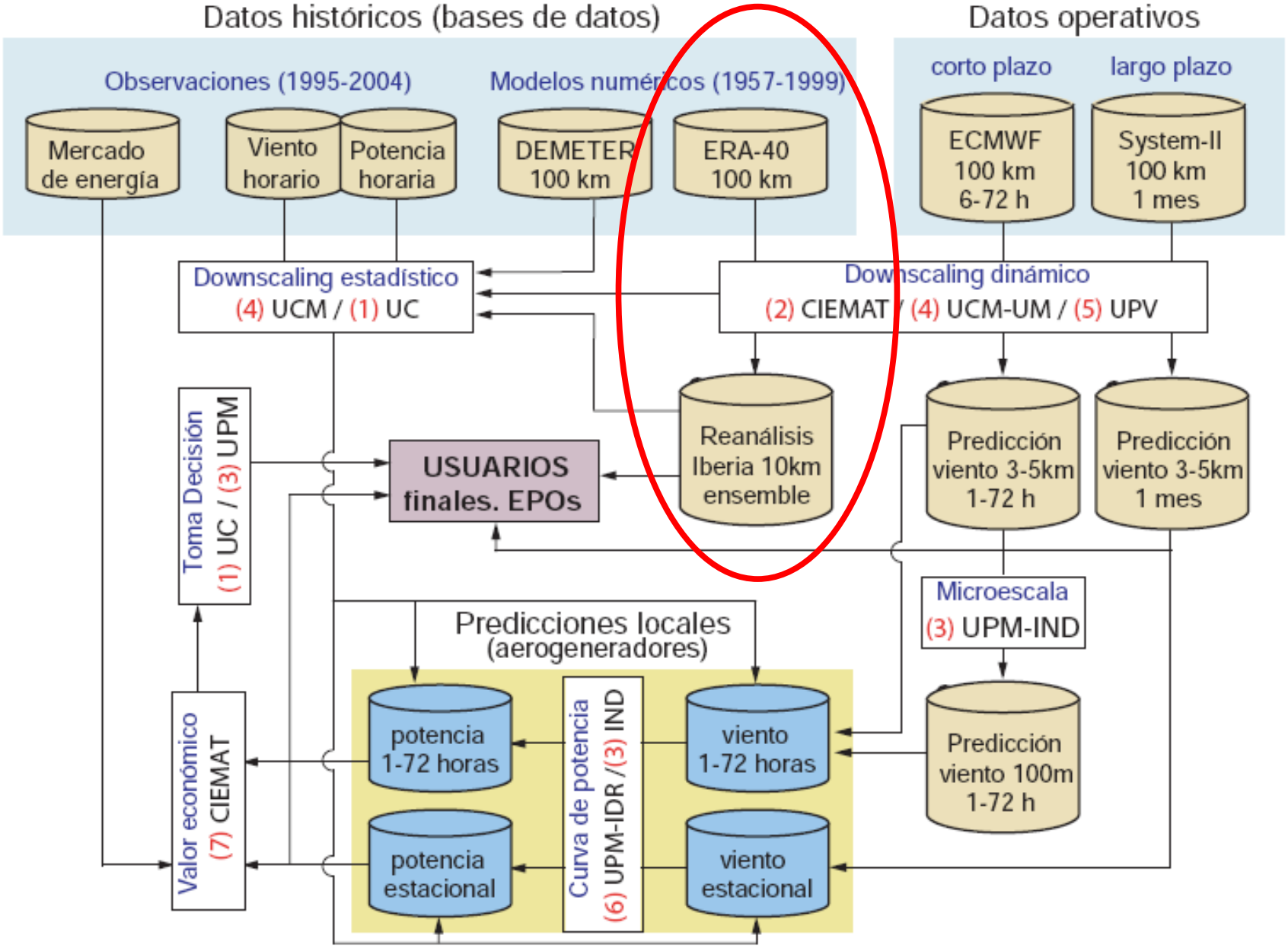

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Objective

Create a **high-resolution meteorological data set** over the Iberian Peninsula with **dynamical consistency** (through the use of a dynamical model) and incorporating as many **observed data** as available.

The WRF (ARW core) model is used

The data assimilation is 3DVAR (WRF-Var module)

Boundary data are provided by ERA40
Observed data are in the archive used to create ERA40

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Status

The computations are being carried out under the ECMWF special project **SPESIPRA**. The following System Billing Units (SBU) were granted:

2006: 87000 SBU
2007: 136500 SBU
2008: 136500 SBU

The WRF model is up and running in HPCF

140 x (16 Dual-chip processors + 32GbRAM)

The data assimilation is functional,
but the input data are not yet ready

The soil model is functional,
but the input data are not yet ready

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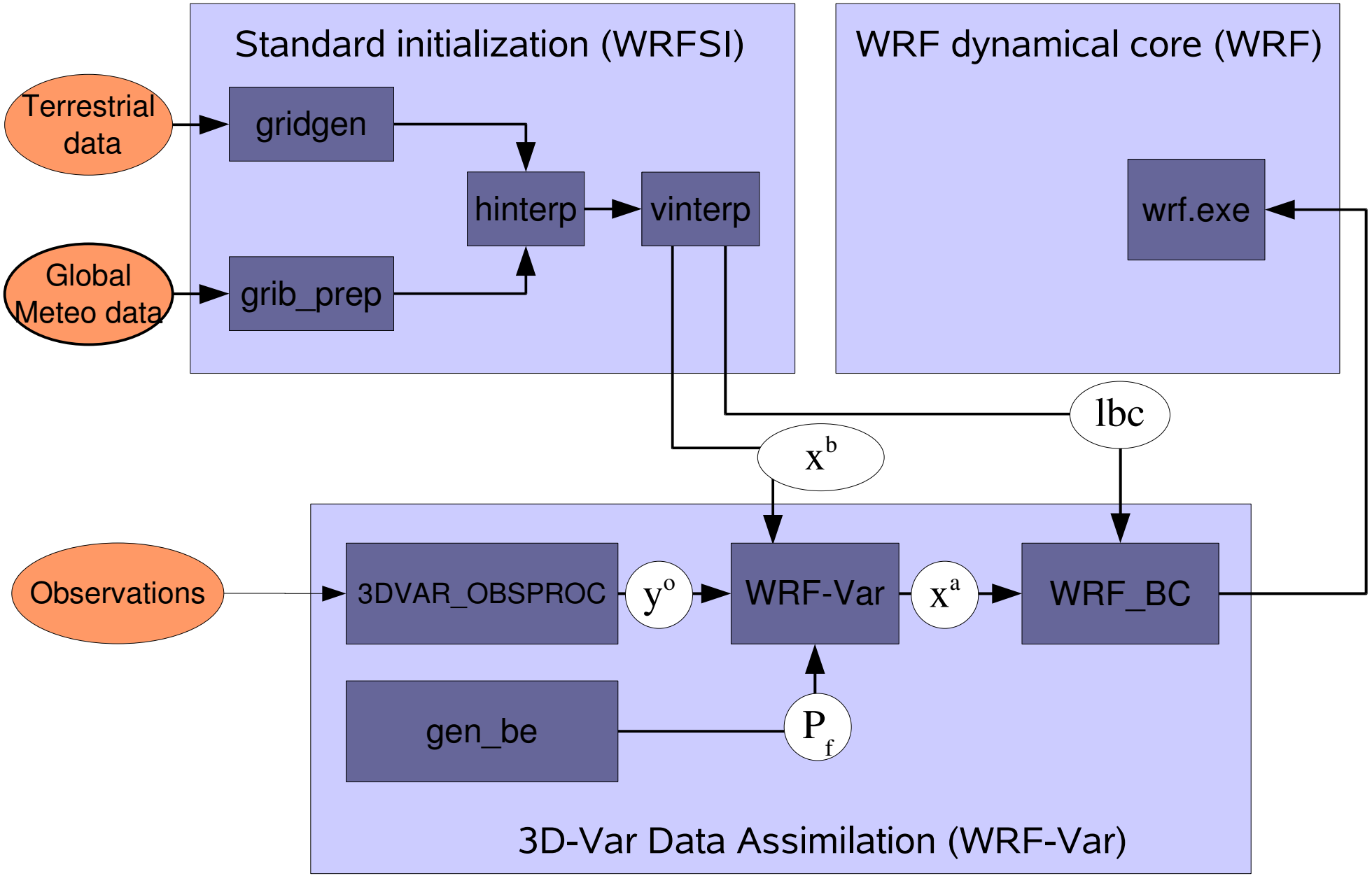
WRF + WRFvar scheme



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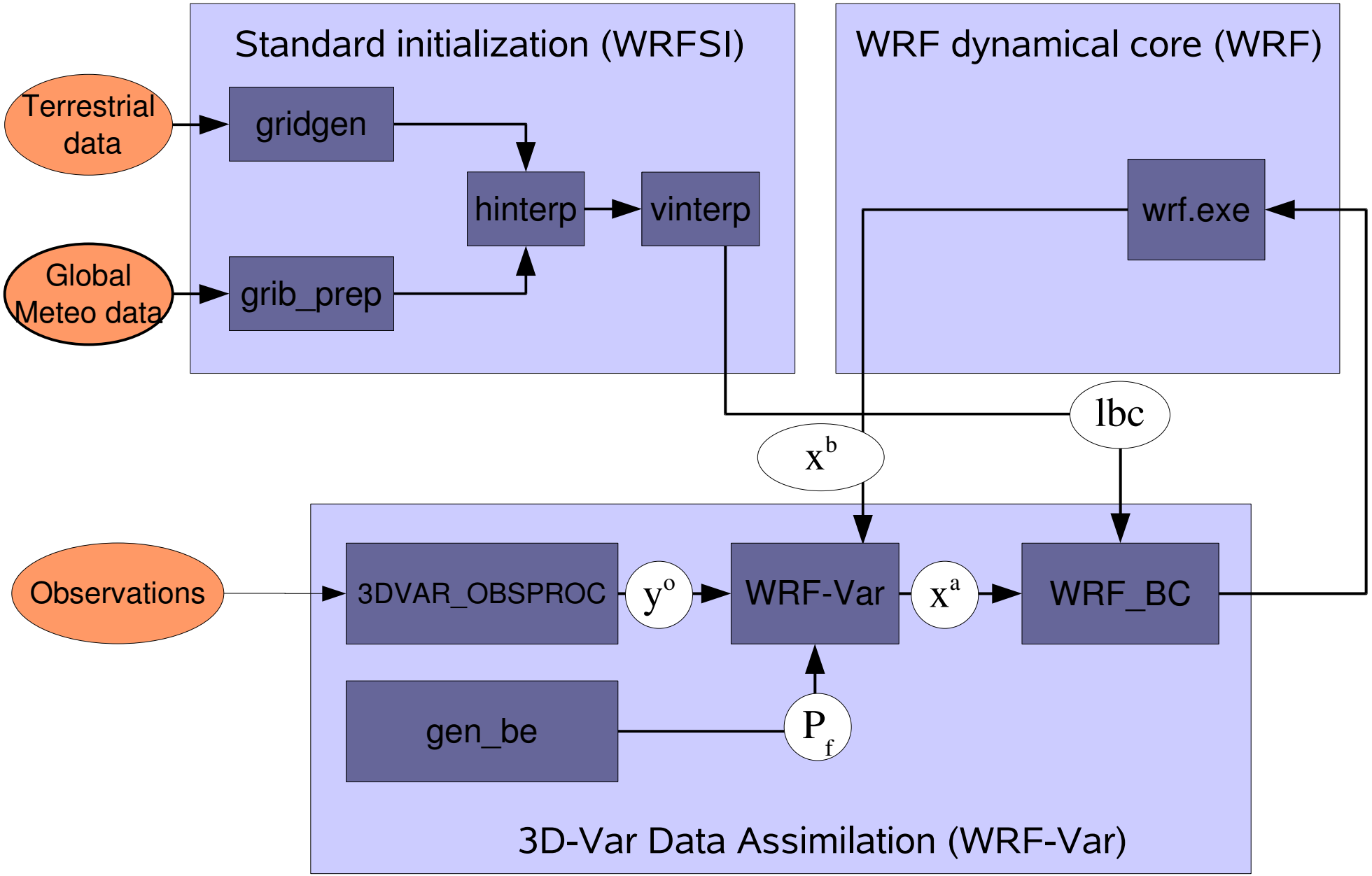
WRF + WRFvar scheme



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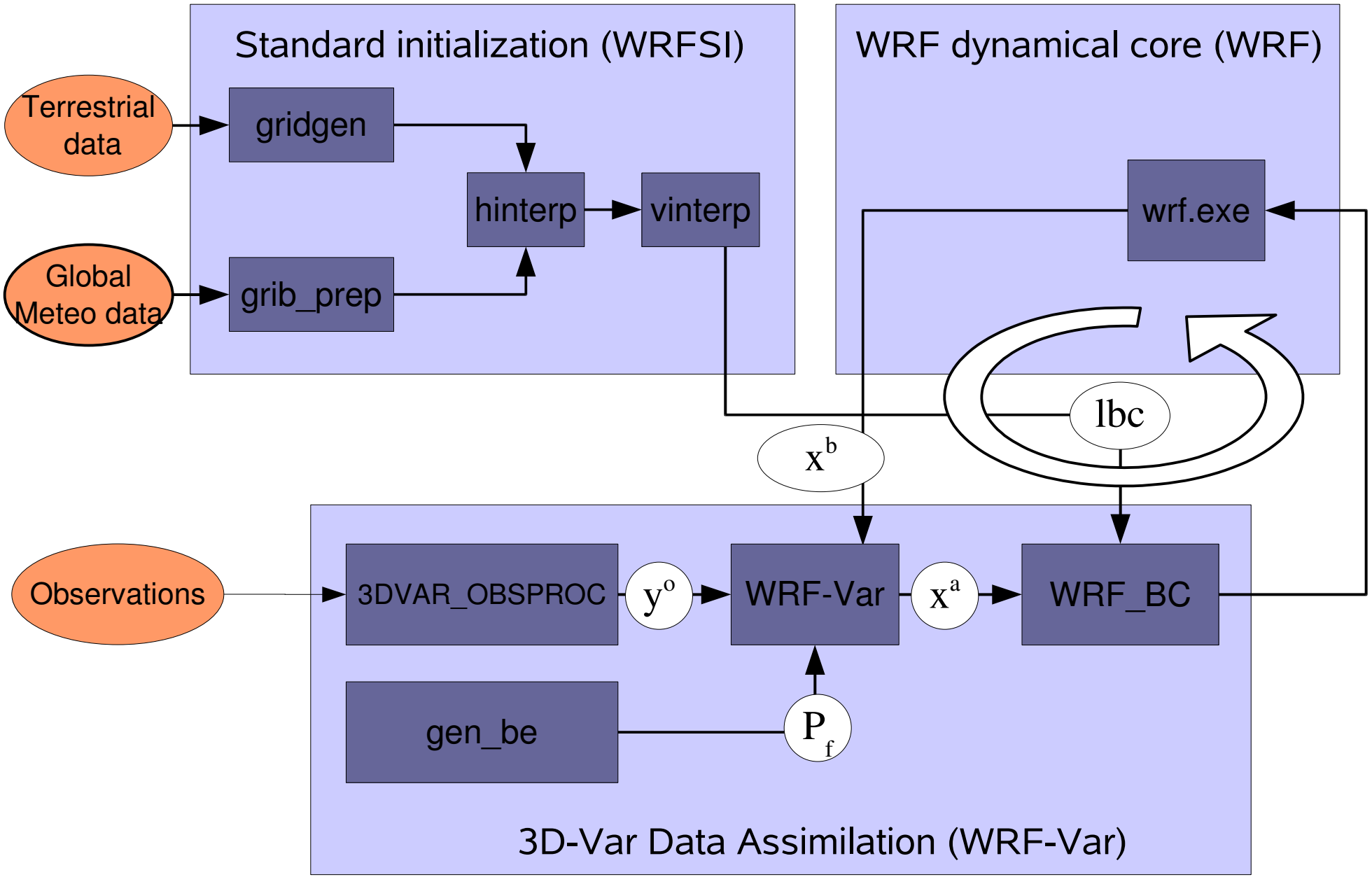
WRF + WRFvar scheme



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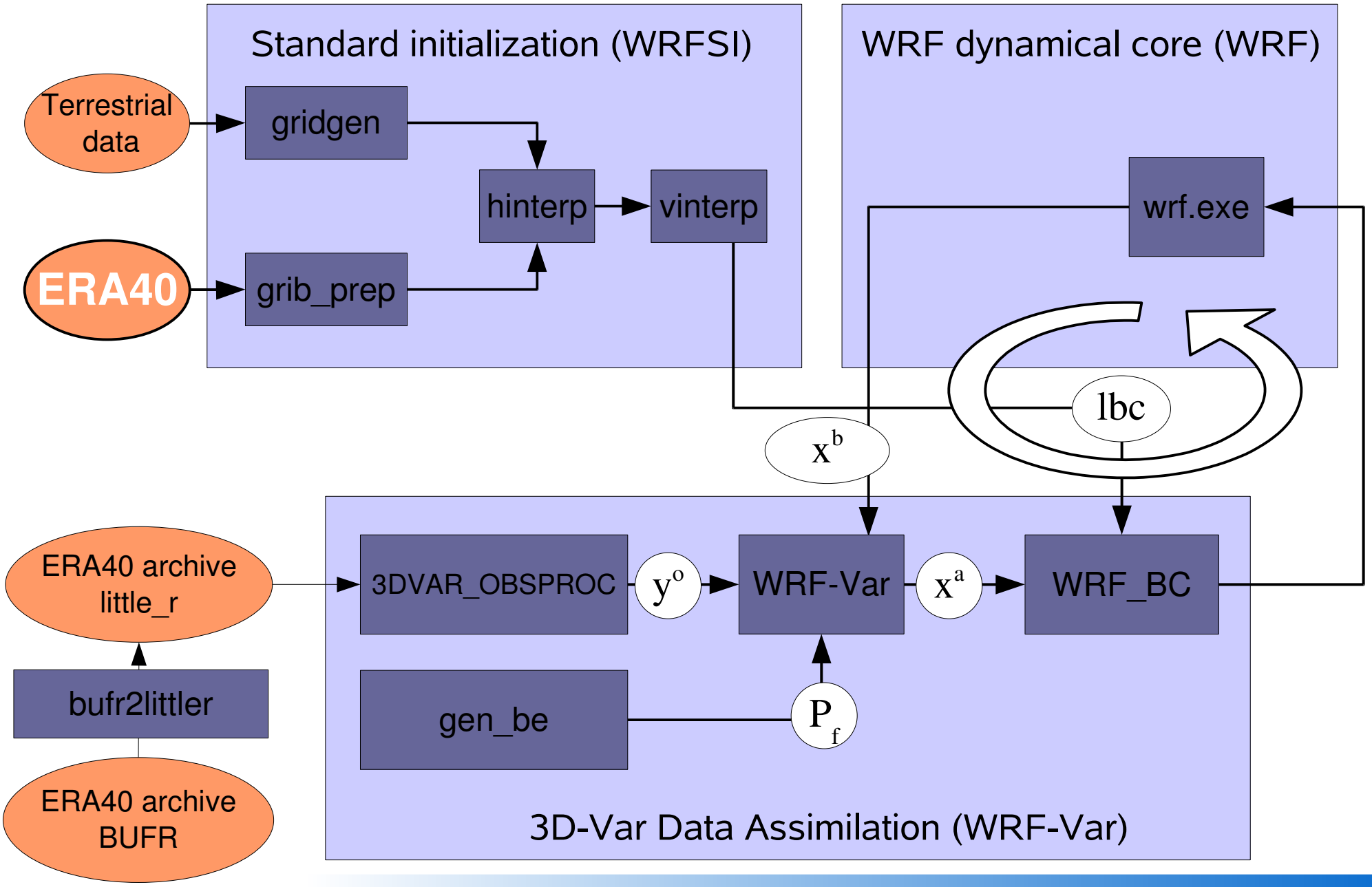
IPRA scheme



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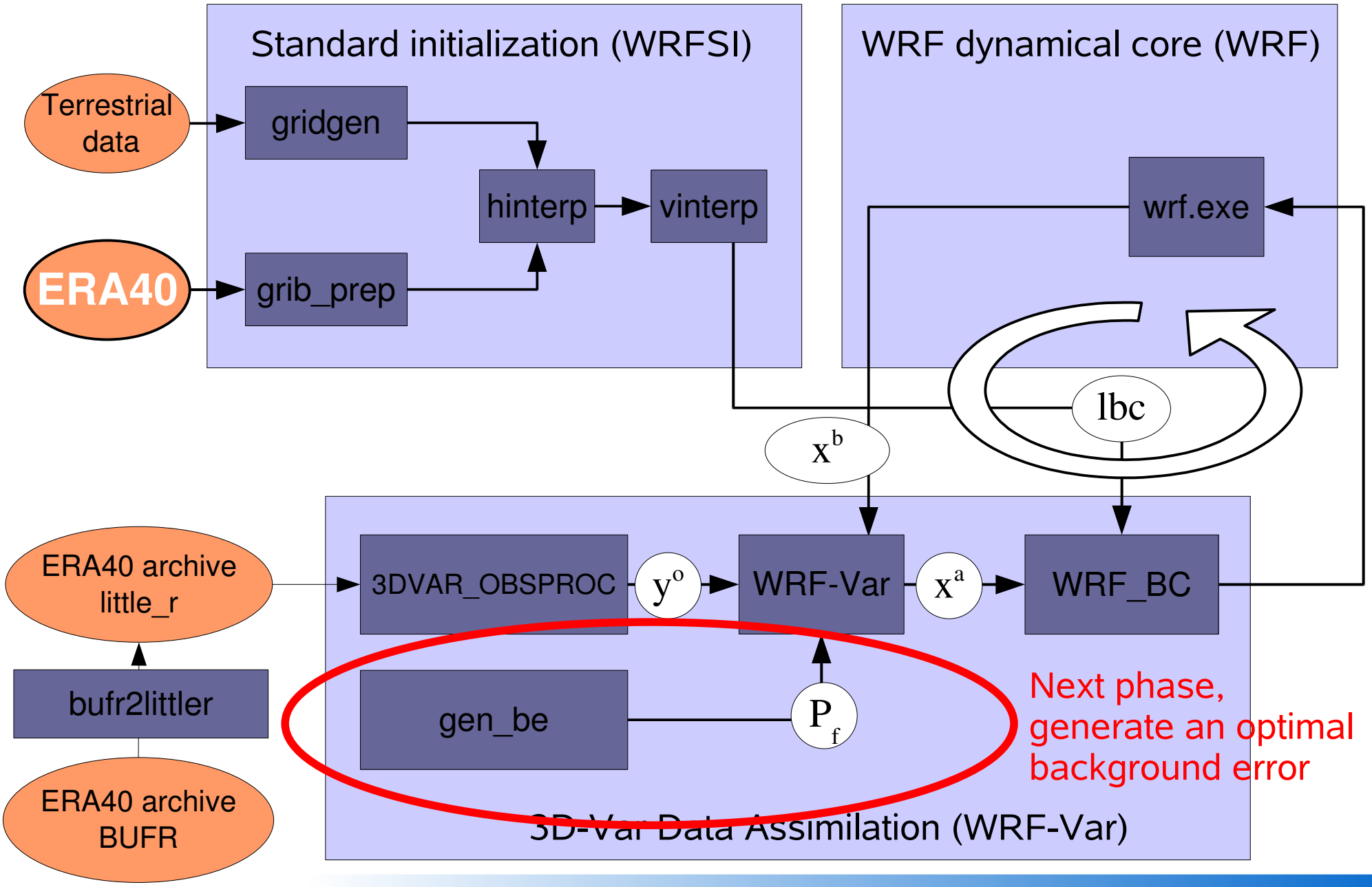
IPRA scheme



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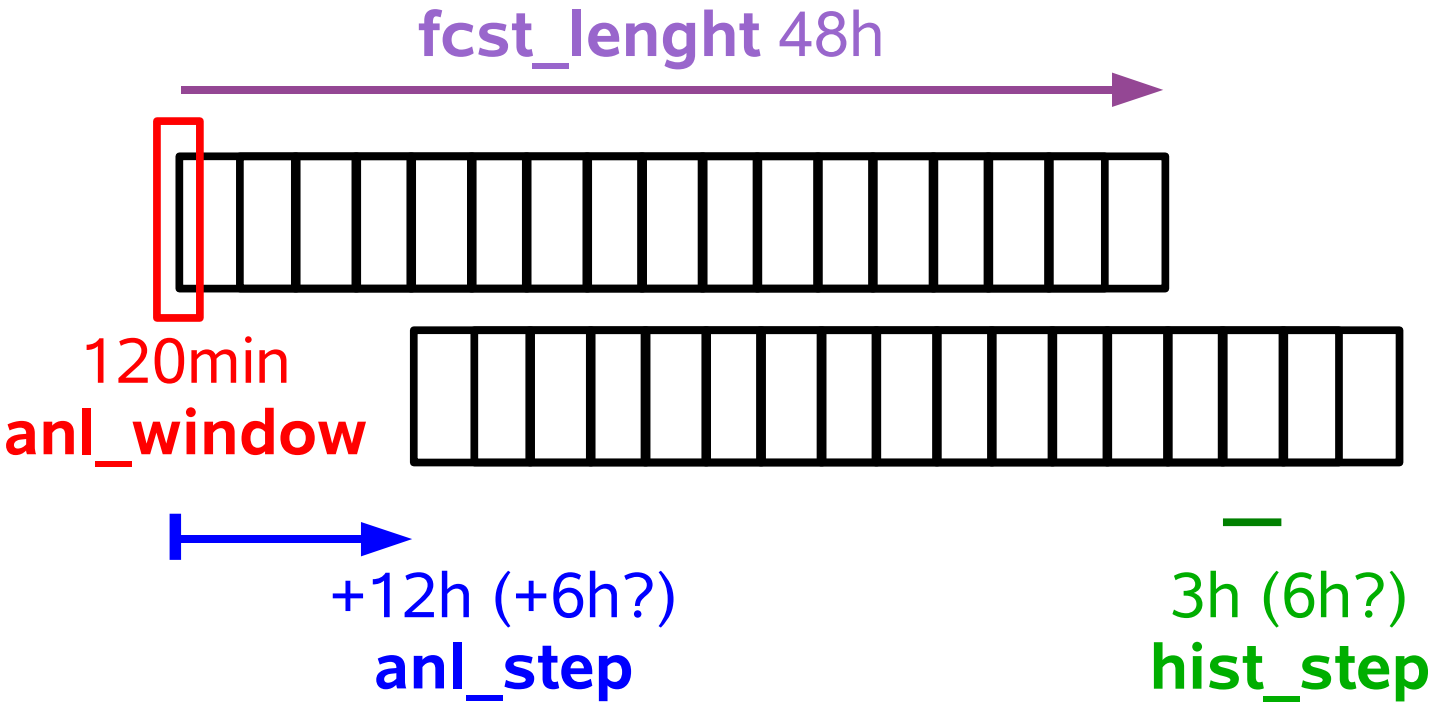
Pending decisions

- Number of nested domains (1 or 2?)
- Position of nested domains
- Resolution
- Physical parameterizations
- Timing

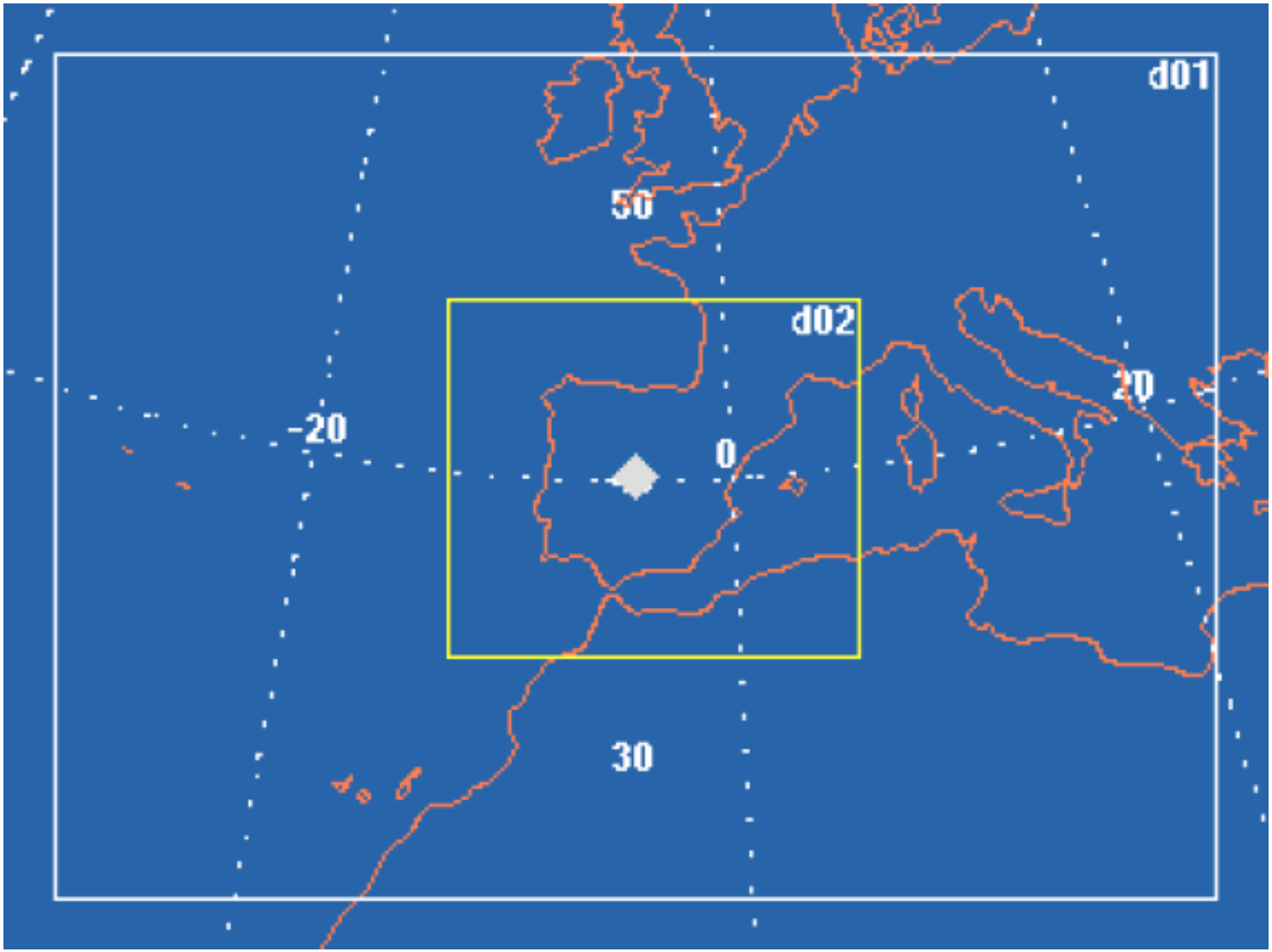


Pending tasks

- Use of high resolution SST
- Design a fully functional *bufr2littler* application
- Sensitivity to:
  - the use 1 or 2 domains
  - the size of the domain(s)
  - the position of the domain(s)
  - the two-way vs. one-way
  - the resolution (both horizontal and VERTICAL)
  - physical parameterizations
  - possibly other issues related to the LSM
- Generation of regional background errors

Domain setup

75 km > 15 km 31 vertical levels



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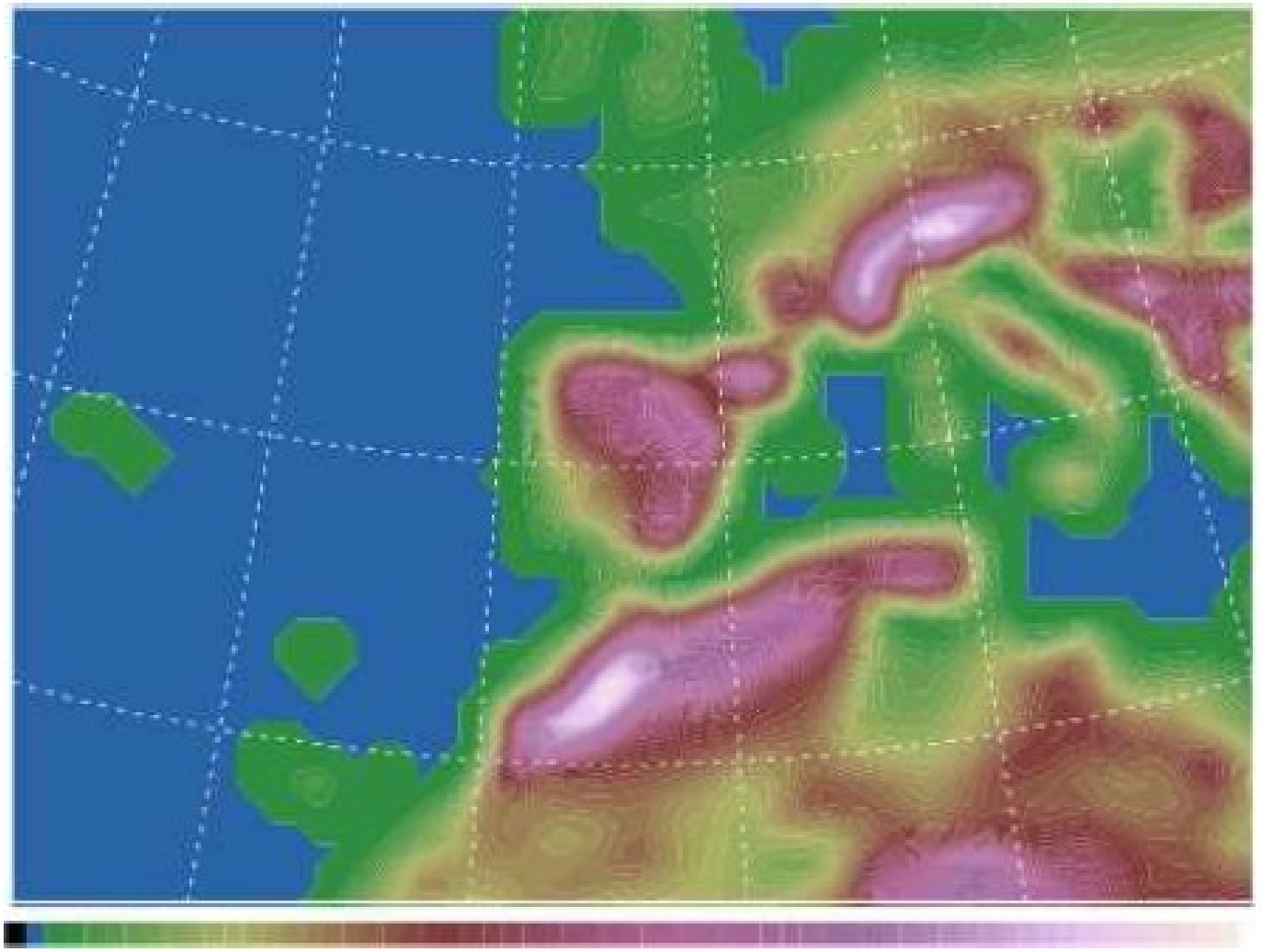
Domain setup

D1: 75 km



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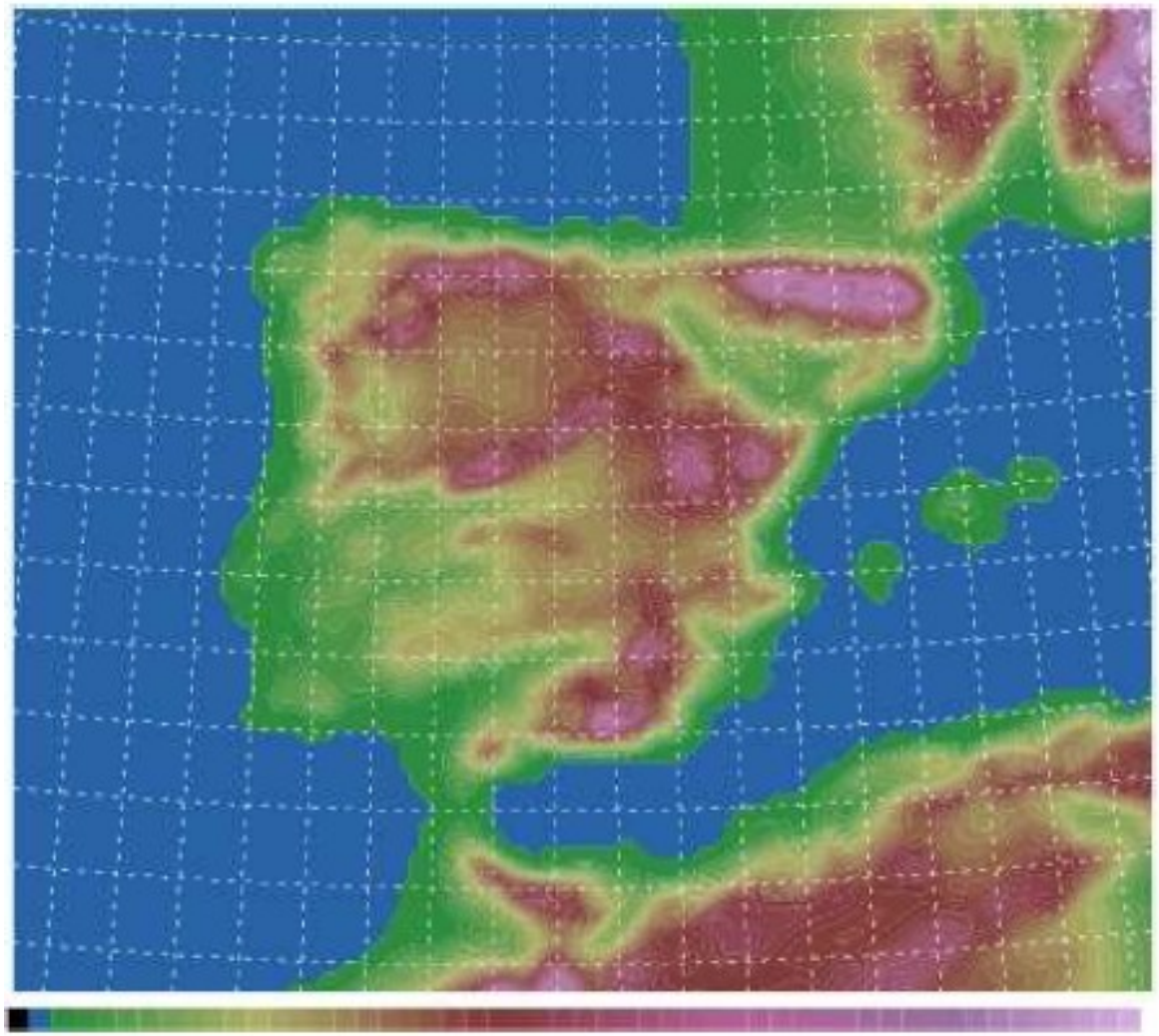
Domain setup

D1: 15 km



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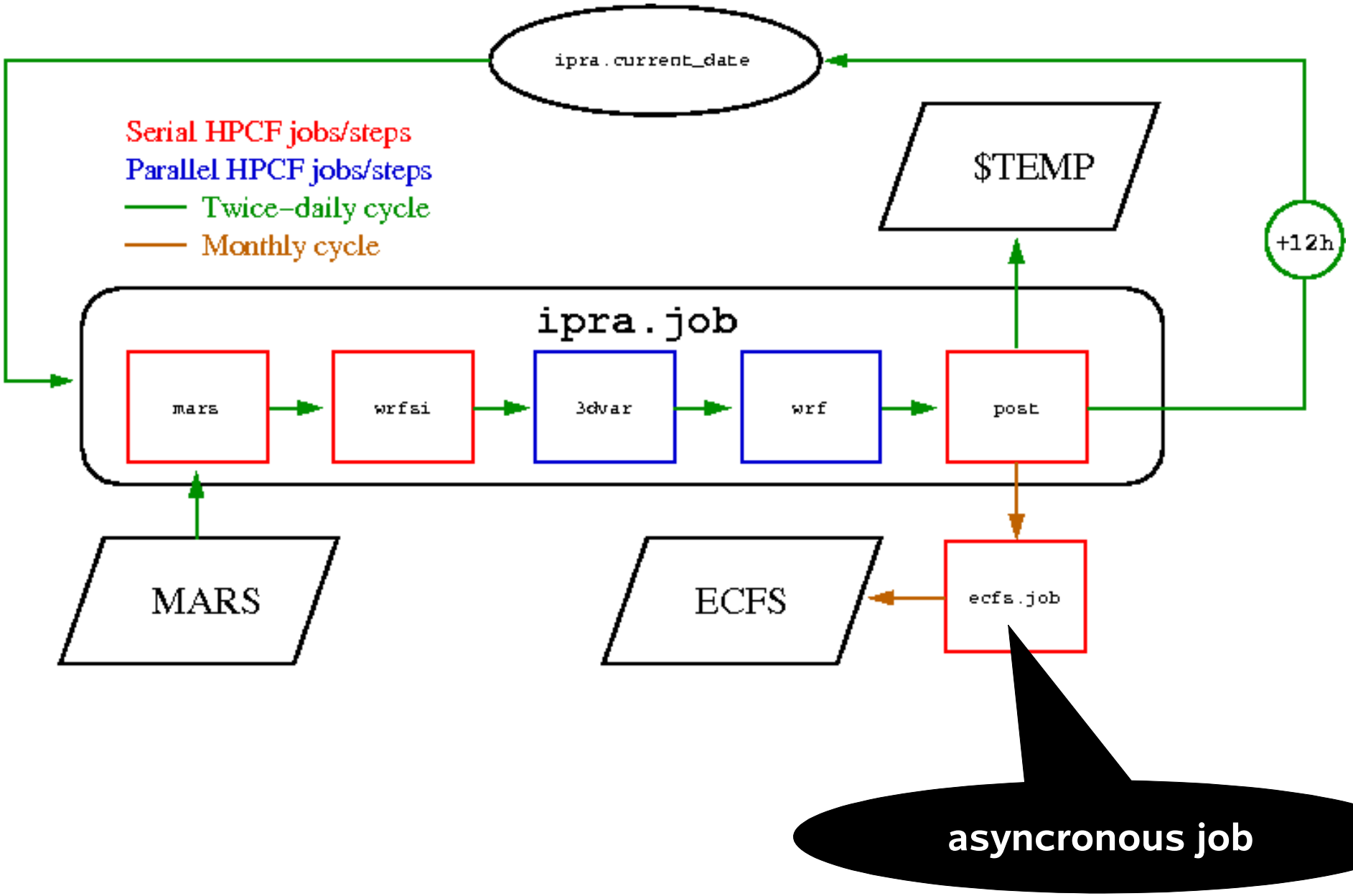
HPCF execution



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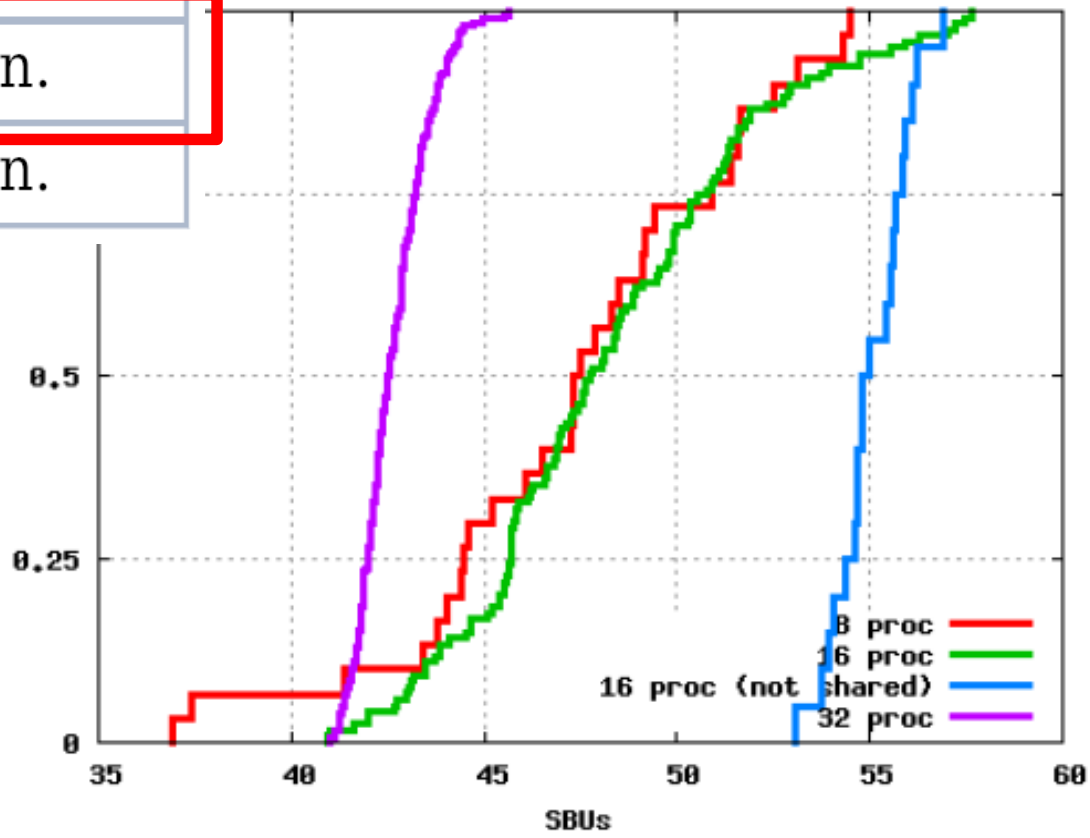
Time performance on HPCF

# proc	SBU/cycle	time/cycle
8	47	91 min.
16	47.6	53 min.
16ns	55	38 min.
32	42.7	28 min.
64	60	21 min.

2x 48h



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Univ de Murcia: Juanpe Montávez y Sonia Jerez

Pruebas con Noah LSM en MM5

Tiempos de relajación de la humedad del suelo muy lentos. Aproximadamente 6 meses para igualar dos simulaciones que empiezan con humedad del suelo diferente.

Posibilidades:

- Calibracion off-line del LSM con observaciones de precipitacion y otras variables (más difíciles de conseguir)
- Hacer una simulacion larga modo climático sin asimilacion y usar la humedad que sale de ella para inicializar el suelo de IPRA

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Summary

- The InVento project aims at producing multi-methodological forecasts of wind power.
- As a tool for InVento and for many other possible uses, the Iberian Peninsula ReAnalysis (IPRA) aims to obtain a 3D high-resolution approximation to the real state of the atmosphere.
- IPRA is based on the WRF modelling suite.
- IPRA is still work in progress...
  - Resultados... en la próxima reunión de la Red Ibérica

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