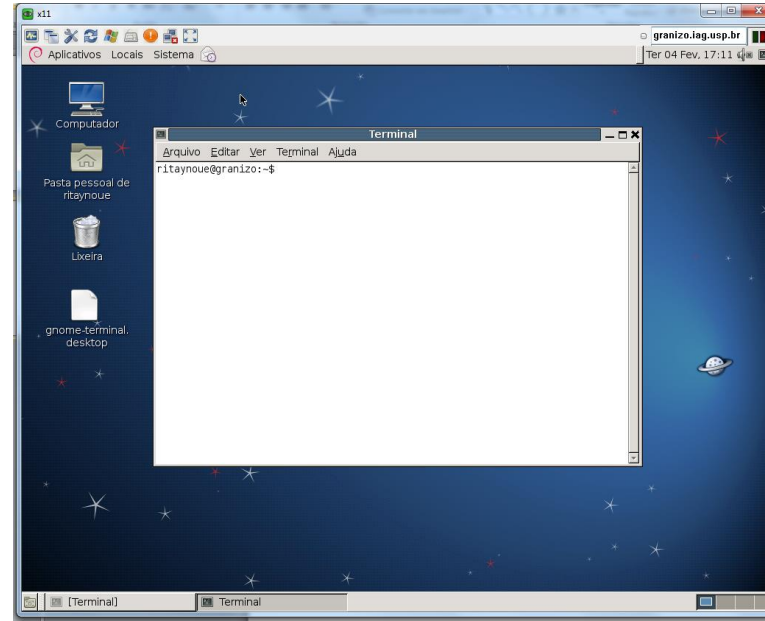
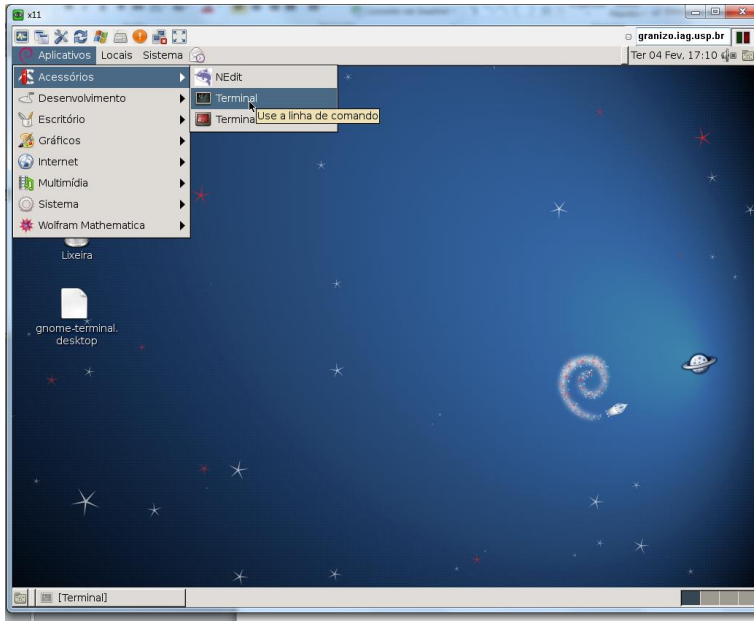


# Ambiente Linux

Lab. Meteo Sinótica

# Entrando nos computadores

- Username: curso3
- Senha: curso3
- Abrir um terminal de comando



# Alguns comandos

- *pwd* -> identifica o diretório atual
- *ls* -> lista o conteúdo do diretório
- *mkdir SEUNOME* -> cria um diretório chamado SEUNOME
- *cd SEUNOME* -> muda para o diretório SEUNOME
- Pular para o slide 15

# Baixando dados da reanálise do ECMWF (ERA-Interim)

- Abrir um navegador (Iceweasel, Epiphany)
- Ir para:
- [http://data-portal.ecmwf.int/data/d/interim\\_full\\_moda/](http://data-portal.ecmwf.int/data/d/interim_full_moda/)

data-portal.ecmwf.int/data/d/interim\_full\_moda/

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ERA Interim, Monthly Means of Daily Means, Full Resolution >

### ERA Interim, Monthly Means of Daily Means, Full Resolution

Type of level  
 Model levels  
 Potential temperature  
 Potential vorticity  
 Pressure levels  
 Surface

**Note** You may be interested in taking part in a [Reanalysis User and Application Survey](#) (closing 31 January 2014)

**NEW Data Server**  
 This server is been replaced by a more powerful system that can be found at <http://apps.ecmwf.int/datasets/>. Please start using this new system, as this server will be discontinued in the near future.

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**Select month**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1979	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1980	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1981	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1982	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1983	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1984	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1985	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1986	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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1989	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1990	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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2013	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Select All or Clear

**Select parameters**

10 metre U wind component  10 metre V wind component

Selecionar:

- meses de janeiro e julho de 2011

E as variáveis:

- 10 metre U wind component

- 10 metre V wind component

- 2 metre temperature

- Mean sea level pressure

- Sea surface temperature

### Select parameters

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> 10 metre U wind component                       | <input checked="" type="checkbox"/> 10 metre V wind component                       |
| <input type="checkbox"/> 10 metre wind speed  | <input type="checkbox"/> 2 metre dewpoint temperature                               |
| <input checked="" type="checkbox"/> 2 metre temperature                             | <input type="checkbox"/> Albedo   |
| <input type="checkbox"/> Boundary layer height                                      | <input type="checkbox"/> Charnock   |
| <input type="checkbox"/> Convective available potential energy                      | <input type="checkbox"/> Forecast albedo  |
| <input type="checkbox"/> Forecast logarithm of surface roughness for heat           | <input type="checkbox"/> Forecast surface roughness                                 |
| <input type="checkbox"/> High cloud cover   | <input type="checkbox"/> Ice temperature layer 1                                    |
| <input type="checkbox"/> Ice temperature layer 2                                    | <input type="checkbox"/> Ice temperature layer 3                                    |
| <input type="checkbox"/> Ice temperature layer 4                                    | <input type="checkbox"/> Instantaneous eastward turbulent surface stress            |
| <input type="checkbox"/> Instantaneous moisture flux                                | <input type="checkbox"/> Instantaneous northward turbulent surface stress           |
| <input type="checkbox"/> Instantaneous surface sensible heat flux                   | <input type="checkbox"/> Logarithm of surface roughness length for heat             |
| <input type="checkbox"/> Low cloud cover  | <input checked="" type="checkbox"/> Mean sea level pressure                         |
| <input type="checkbox"/> Medium cloud cover   | <input checked="" type="checkbox"/> Sea surface temperature                         |
| <input type="checkbox"/> Sea-ice cover  | <input type="checkbox"/> Skin reservoir content                                     |
| <input type="checkbox"/> Skin temperature   | <input type="checkbox"/> Snow albedo  |
| <input type="checkbox"/> Snow density   | <input type="checkbox"/> Snow depth   |
| <input type="checkbox"/> Soil temperature level 1                                   | <input type="checkbox"/> Soil temperature level 2                                   |
| <input type="checkbox"/> Soil temperature level 3                                   | <input type="checkbox"/> Soil temperature level 4                                   |
| <input type="checkbox"/> Surface pressure   | <input type="checkbox"/> Surface roughness  |
| <input type="checkbox"/> Temperature of snow layer                                  | <input type="checkbox"/> Total cloud cover  |
| <input type="checkbox"/> Total column ice water                                     | <input type="checkbox"/> Total column liquid water                                  |
| <input type="checkbox"/> Total column ozone   | <input type="checkbox"/> Total column water   |
| <input type="checkbox"/> Total column water vapour                                  | <input type="checkbox"/> Vertical integral of cloud frozen water                    |
| <input type="checkbox"/> Vertical integral of cloud liquid water                    | <input type="checkbox"/> Vertical integral of divergence of cloud frozen water flux |
| <input type="checkbox"/> Vertical integral of divergence of cloud liquid water flux | <input type="checkbox"/> Vertical integral of divergence of geopotential flux       |
| <input type="checkbox"/> Vertical integral of divergence of kinetic energy flux     | <input type="checkbox"/> Vertical integral of divergence of mass flux               |
| <input type="checkbox"/> Vertical integral of divergence of moisture flux           | <input type="checkbox"/> Vertical integral of divergence of ozone flux              |
| <input type="checkbox"/> Vertical integral of divergence of thermal energy flux     | <input type="checkbox"/> Vertical integral of divergence of total energy flux       |

- Skin temperature
- Snow density
- Soil temperature level 1
- Soil temperature level 3
- Surface pressure
- Temperature of snow layer
- Total column ice water
- Total column ozone
- Total column water vapour
- Vertical integral of cloud liquid water
- Vertical integral of divergence of cloud liquid water flux
- Vertical integral of divergence of kinetic energy flux
- Vertical integral of divergence of moisture flux
- Vertical integral of divergence of thermal energy flux
- Vertical integral of eastward cloud frozen water flux
- Vertical integral of eastward geopotential flux
- Vertical integral of eastward kinetic energy flux
- Vertical integral of eastward ozone flux
- Vertical integral of eastward water vapour flux
- Vertical integral of kinetic energy
- Vertical integral of mass tendency
- Vertical integral of northward cloud liquid water flux
- Vertical integral of northward heat flux
- Vertical integral of northward mass flux
- Vertical integral of northward total energy flux
- Vertical integral of ozone
- Vertical integral of potential+internal+latent energy
- Vertical integral of thermal energy
- Vertical integral of water vapour
- Volumetric soil water layer 2
- Volumetric soil water layer 4
- Snow albedo
- Snow depth
- Soil temperature level 2
- Soil temperature level 4
- Surface roughness
- Total cloud cover
- Total column liquid water
- Total column water
- Vertical integral of cloud frozen water
- Vertical integral of divergence of cloud frozen water flux
- Vertical integral of divergence of geopotential flux
- Vertical integral of divergence of mass flux
- Vertical integral of divergence of ozone flux
- Vertical integral of divergence of total energy flux
- Vertical integral of eastward cloud liquid water flux
- Vertical integral of eastward heat flux
- Vertical integral of eastward mass flux
- Vertical integral of eastward total energy flux
- Vertical integral of energy conversion
- Vertical integral of mass of atmosphere
- Vertical integral of northward cloud frozen water flux
- Vertical integral of northward geopotential flux
- Vertical integral of northward kinetic energy flux
- Vertical integral of northward ozone flux
- Vertical integral of northward water vapour flux
- Vertical integral of potential+internal energy
- Vertical integral of temperature
- Vertical integral of total energy
- Volumetric soil water layer 1
- Volumetric soil water layer 3

Select All or Clear

Note: In order to retrieve data from this server, you first have to accept the [conditions of use](#).

If you experience any difficulties, please check our [data FAQ](#) first

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<b>Email:</b>	<input type="text" value="ritaynoue@model.iag.usp.br"/>
<b>Name:</b>	<input type="text" value="Rita Ynoue"/>
<b>Organisation:</b>	<input type="text" value="USP"/>
<b>Country:</b>	<input type="text" value="Brazil"/>
<input type="button" value="Decline"/> <input type="button" value="Accept"/>	



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### ERA Interim, Monthly Means of Daily Means, Full Resolution

Type of level  
 Model levels  
 Potential temperature  
 Potential vorticity  
 Pressure levels  
 Surface

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**Select month**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1979	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1980	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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1983	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1984	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1985	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1986	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1987	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1988	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1989	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1990	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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1993	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1994	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1995	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1996	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1997	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1998	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1999	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2001	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2002	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2003	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2004	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2005	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2006	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2007	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2008	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2009	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2010	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2011	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2012	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2013	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Select All or Clear

**Select parameters**

10 metre U wind component  10 metre V wind component

Selecionar:

- meses de janeiro e julho de 2011

E as variáveis:

- 10 metre U wind component
- 10 metre V wind component
- 2 metre temperature
- Mean sea level pressure
- Sea surface temperature

### Select parameters

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> 10 metre U wind component                       | <input checked="" type="checkbox"/> 10 metre V wind component                       |
| <input type="checkbox"/> 10 metre wind speed  | <input type="checkbox"/> 2 metre dewpoint temperature                               |
| <input checked="" type="checkbox"/> 2 metre temperature                             | <input type="checkbox"/> Albedo   |
| <input type="checkbox"/> Boundary layer height                                      | <input type="checkbox"/> Charnock   |
| <input type="checkbox"/> Convective available potential energy                      | <input type="checkbox"/> Forecast albedo  |
| <input type="checkbox"/> Forecast logarithm of surface roughness for heat           | <input type="checkbox"/> Forecast surface roughness                                 |
| <input type="checkbox"/> High cloud cover   | <input type="checkbox"/> Ice temperature layer 1                                    |
| <input type="checkbox"/> Ice temperature layer 2                                    | <input type="checkbox"/> Ice temperature layer 3                                    |
| <input type="checkbox"/> Ice temperature layer 4                                    | <input type="checkbox"/> Instantaneous eastward turbulent surface stress            |
| <input type="checkbox"/> Instantaneous moisture flux                                | <input type="checkbox"/> Instantaneous northward turbulent surface stress           |
| <input type="checkbox"/> Instantaneous surface sensible heat flux                   | <input type="checkbox"/> Logarithm of surface roughness length for heat             |
| <input type="checkbox"/> Low cloud cover  | <input checked="" type="checkbox"/> Mean sea level pressure                         |
| <input type="checkbox"/> Medium cloud cover   | <input checked="" type="checkbox"/> Sea surface temperature                         |
| <input type="checkbox"/> Sea-ice cover  | <input type="checkbox"/> Skin reservoir content                                     |
| <input type="checkbox"/> Skin temperature   | <input type="checkbox"/> Snow albedo  |
| <input type="checkbox"/> Snow density   | <input type="checkbox"/> Snow depth   |
| <input type="checkbox"/> Soil temperature level 1                                   | <input type="checkbox"/> Soil temperature level 2                                   |
| <input type="checkbox"/> Soil temperature level 3                                   | <input type="checkbox"/> Soil temperature level 4                                   |
| <input type="checkbox"/> Surface pressure   | <input type="checkbox"/> Surface roughness  |
| <input type="checkbox"/> Temperature of snow layer                                  | <input type="checkbox"/> Total cloud cover  |
| <input type="checkbox"/> Total column ice water                                     | <input type="checkbox"/> Total column liquid water                                  |
| <input type="checkbox"/> Total column ozone   | <input type="checkbox"/> Total column water   |
| <input type="checkbox"/> Total column water vapour                                  | <input type="checkbox"/> Vertical integral of cloud frozen water                    |
| <input type="checkbox"/> Vertical integral of cloud liquid water                    | <input type="checkbox"/> Vertical integral of divergence of cloud frozen water flux |
| <input type="checkbox"/> Vertical integral of divergence of cloud liquid water flux | <input type="checkbox"/> Vertical integral of divergence of geopotential flux       |
| <input type="checkbox"/> Vertical integral of divergence of kinetic energy flux     | <input type="checkbox"/> Vertical integral of divergence of mass flux               |
| <input type="checkbox"/> Vertical integral of divergence of moisture flux           | <input type="checkbox"/> Vertical integral of divergence of ozone flux              |
| <input type="checkbox"/> Vertical integral of divergence of thermal energy flux     | <input type="checkbox"/> Vertical integral of divergence of total energy flux       |

data-portal.ecmwf.int/data/d/interim\_full\_moda/

<input type="checkbox"/> Soil temperature level 3	<input type="checkbox"/> Soil temperature level 4
<input type="checkbox"/> Surface pressure	<input type="checkbox"/> Surface roughness
<input type="checkbox"/> Temperature of snow layer	<input type="checkbox"/> Total cloud cover
<input type="checkbox"/> Total column ice water	<input type="checkbox"/> Total column liquid water
<input type="checkbox"/> Total column ozone	<input type="checkbox"/> Total column water
<input type="checkbox"/> Total column water vapour	<input type="checkbox"/> Vertical integral of cloud frozen water
<input type="checkbox"/> Vertical integral of cloud liquid water	<input type="checkbox"/> Vertical integral of divergence of cloud frozen water flux
<input type="checkbox"/> Vertical integral of divergence of cloud liquid water flux	<input type="checkbox"/> Vertical integral of divergence of geopotential flux
<input type="checkbox"/> Vertical integral of divergence of kinetic energy flux	<input type="checkbox"/> Vertical integral of divergence of mass flux
<input type="checkbox"/> Vertical integral of divergence of moisture flux	<input type="checkbox"/> Vertical integral of divergence of ozone flux
<input type="checkbox"/> Vertical integral of divergence of thermal energy flux	<input type="checkbox"/> Vertical integral of divergence of total energy flux
<input type="checkbox"/> Vertical integral of eastward cloud frozen water flux	<input type="checkbox"/> Vertical integral of eastward cloud liquid water flux
<input type="checkbox"/> Vertical integral of eastward geopotential flux	<input type="checkbox"/> Vertical integral of eastward heat flux
<input type="checkbox"/> Vertical integral of eastward kinetic energy flux	<input type="checkbox"/> Vertical integral of eastward mass flux
<input type="checkbox"/> Vertical integral of eastward ozone flux	<input type="checkbox"/> Vertical integral of eastward total energy flux
<input type="checkbox"/> Vertical integral of eastward water vapour flux	<input type="checkbox"/> Vertical integral of energy conversion
<input type="checkbox"/> Vertical integral of kinetic energy	<input type="checkbox"/> Vertical integral of mass of atmosphere
<input type="checkbox"/> Vertical integral of mass tendency	<input type="checkbox"/> Vertical integral of northward cloud frozen water flux
<input type="checkbox"/> Vertical integral of northward cloud liquid water flux	<input type="checkbox"/> Vertical integral of northward geopotential flux
<input type="checkbox"/> Vertical integral of northward heat flux	<input type="checkbox"/> Vertical integral of northward kinetic energy flux
<input type="checkbox"/> Vertical integral of northward mass flux	<input type="checkbox"/> Vertical integral of northward ozone flux
<input type="checkbox"/> Vertical integral of northward total energy flux	<input type="checkbox"/> Vertical integral of northward water vapour flux
<input type="checkbox"/> Vertical integral of ozone	<input type="checkbox"/> Vertical integral of potential+internal energy
<input type="checkbox"/> Vertical integral of potential+internal+latent energy	<input type="checkbox"/> Vertical integral of temperature
<input type="checkbox"/> Vertical integral of thermal energy	<input type="checkbox"/> Vertical integral of total energy
<input type="checkbox"/> Vertical integral of water vapour	<input type="checkbox"/> Volumetric soil water layer 1
<input type="checkbox"/> Volumetric soil water layer 2	<input type="checkbox"/> Volumetric soil water layer 3
<input type="checkbox"/> Volumetric soil water layer 4	

[Select All](#) or [Clear](#)

**Note:**

The provision of NetCDF is **experimental** and the format produced **will change** in the future

If you experience any difficulties, please check our [data FAQ](#) first

# Retrieve NetCDF

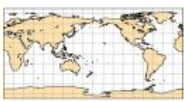

## netcdf10

### ERA Interim, Monthly means of Daily means

*Type:* Analysis  
*Type of level:* Surface  
*Month:* 201101, 201107  
*Parameter:* 10 metre U wind component, 10 metre V wind component, 2 metre temperature, Mean sea level pressure, Sea surface temperature

**Please note:**  
 The default area is global and the default representation is on gaussian grids for surface fields and spherical harmonics or gaussian grids for upper air fields. You can interpolate the data to a lat/lon grid or choose a sub-area by clicking on the icons below. Note that to be able to select a sub-area, you also need to choose a lat/lon grid, otherwise the retrieval will fail.

### The netcdf will be done using the following attributes:

Area:  Grid: 

Default (as archived) Default (as archived)

### Retrieve and convert to NetCDF:

[Now](#)

Now

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Committees Order Software PreplFS Seasonal Library Open Tenders





[Personal](#) > [Results of your tasks](#) > netcdf10, Tue Feb 4 19:37:19 2014>

### netcdf10, Tue Feb 4 19:37:19 2014

Surface 201101, 201107 interim\_full\_moda Monthly means of Daily means ERA Interim Analysis ..., 10 metre U wind component, Mean sea level pressure

Task complete

10 fields retrieved

Name	Size	Created	
 <a href="#">nc</a>	2.2 Mbytes	Tue Feb 4 19:37:24 2014	
 <a href="#">grib</a>	2.1 Mbytes	Tue Feb 4 19:37:24 2014	

**Please note:**  
Thank you for downloading ECMWF data

Abrir "output.nc"

Você selecionou abrir:

**output.nc**  
Tipo: nc File (2,2 MB)  
Site: http://download.ecmwf.int

O que o Firefox deve fazer?

**Abrir com o:**

**Download**

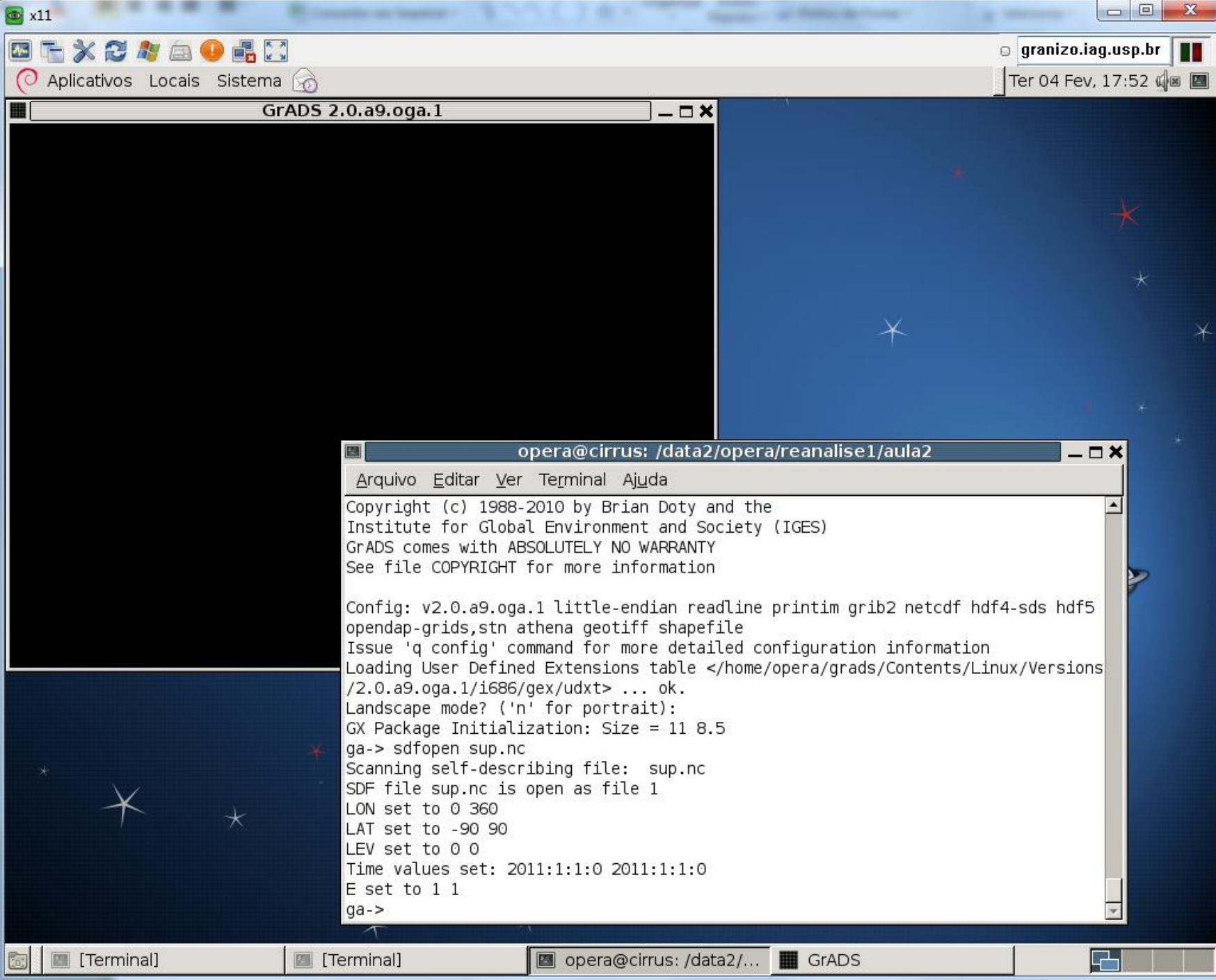
**Memorizar a decisão para este tipo de arquivo**

# Copiar do diretório Downloads para o seu diretório

- `cd Downloads/`
- `mv output.nc /home/curso1/seunome`
- `cd /home/curso1/seunome`
- `mv output.nc sup.nc`

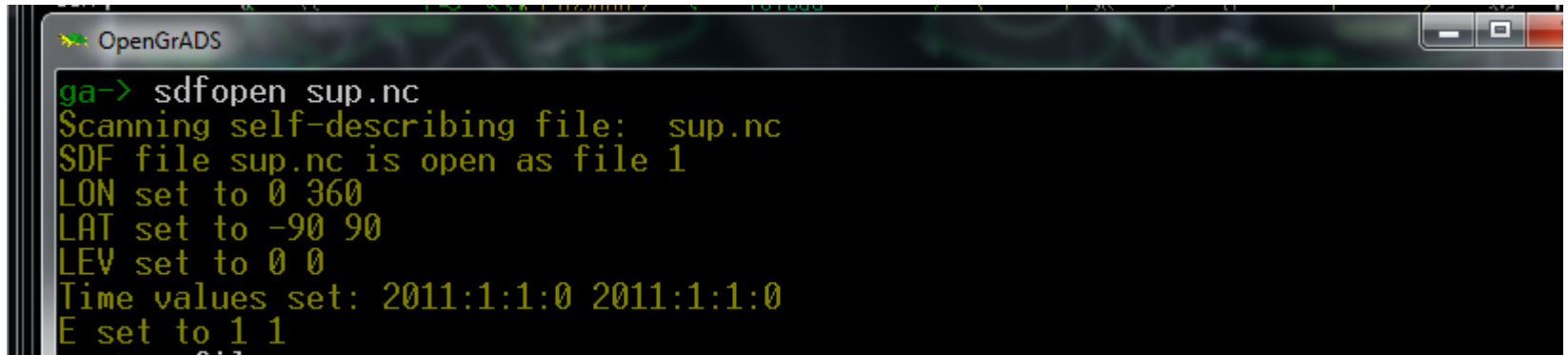
# Copiar o arquivo sup.nc

- *cp* (ver na lousa o caminho)/*sup.nc* .
- *ls* (verificar se o arquivo foi copiado para o seu diretório)
- ABRINDO O GRADS (Grid Analysis and Display System)
- *grads*
- enter
- *sdfopen sup.nc*





# Grads



```
OpenGrADS
ga-> sdfopen sup.nc
Scanning self-describing file: sup.nc
SDF file sup.nc is open as file 1
LON set to 0 360
LAT set to -90 90
LEV set to 0 0
Time values set: 2011:1:1:0 2011:1:1:0
E set to 1 1
```

Descrição do arquivo:

O arquivo **sup.nc** é o arquivo no. 1

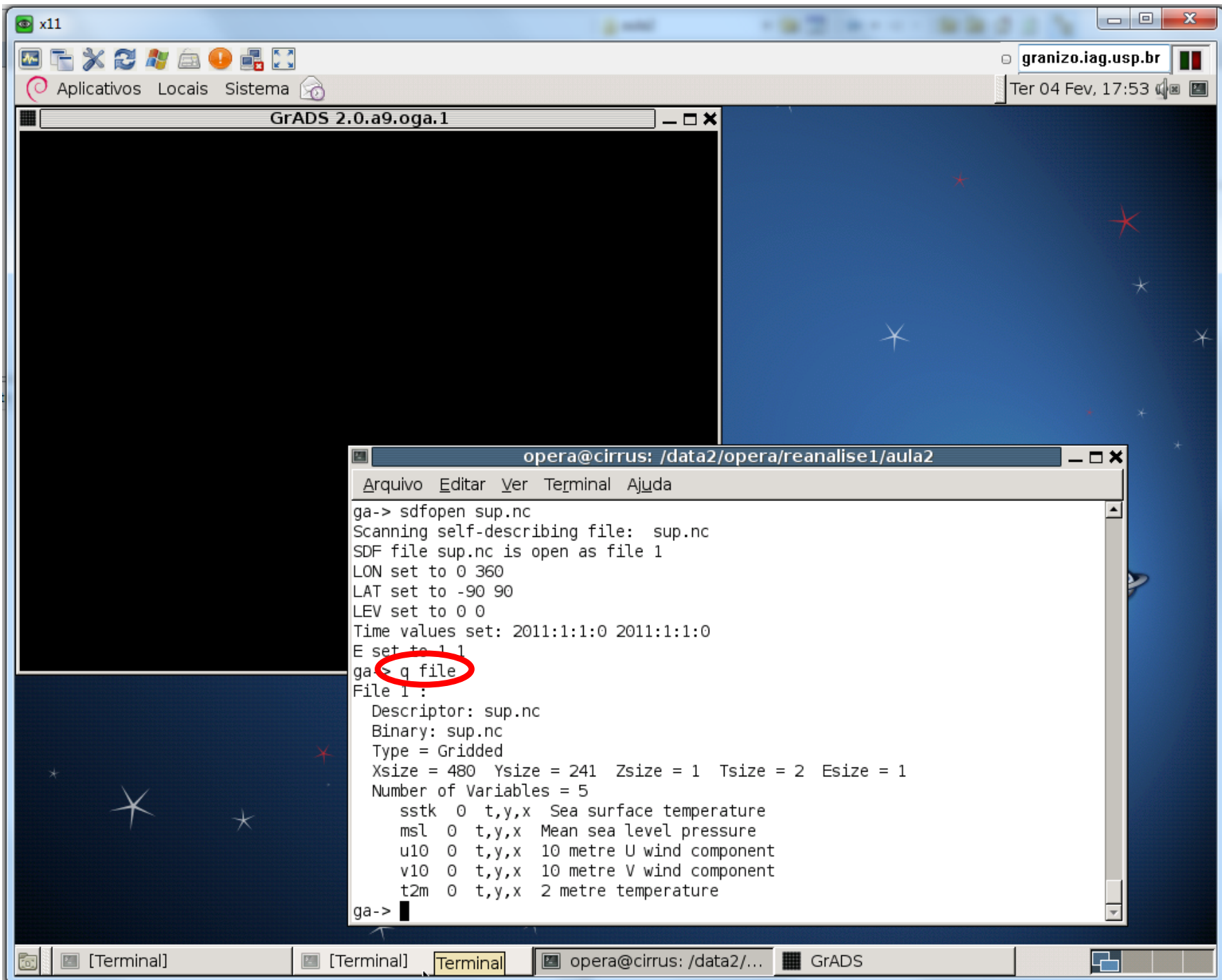
**LONGITUDE** está “setada” para 0 a 360

**LATITUDE** está “setada” para -90 a 90

**LEVEL** (NÍVEL) está “setado” para 0

**TIME** (TEMPO) está “setado” para dia 01 de janeiro de 2011 às 00UTC

**ENSEMBLE** (número de componentes ENSEMBLE) está “setado” para 1



# Grads

- Qual o espaçamento em graus de latitude?
- Qual o espaçamento em graus de longitude?
- Quantos tempos tem o arquivo?
- Quais são as variáveis do arquivo?

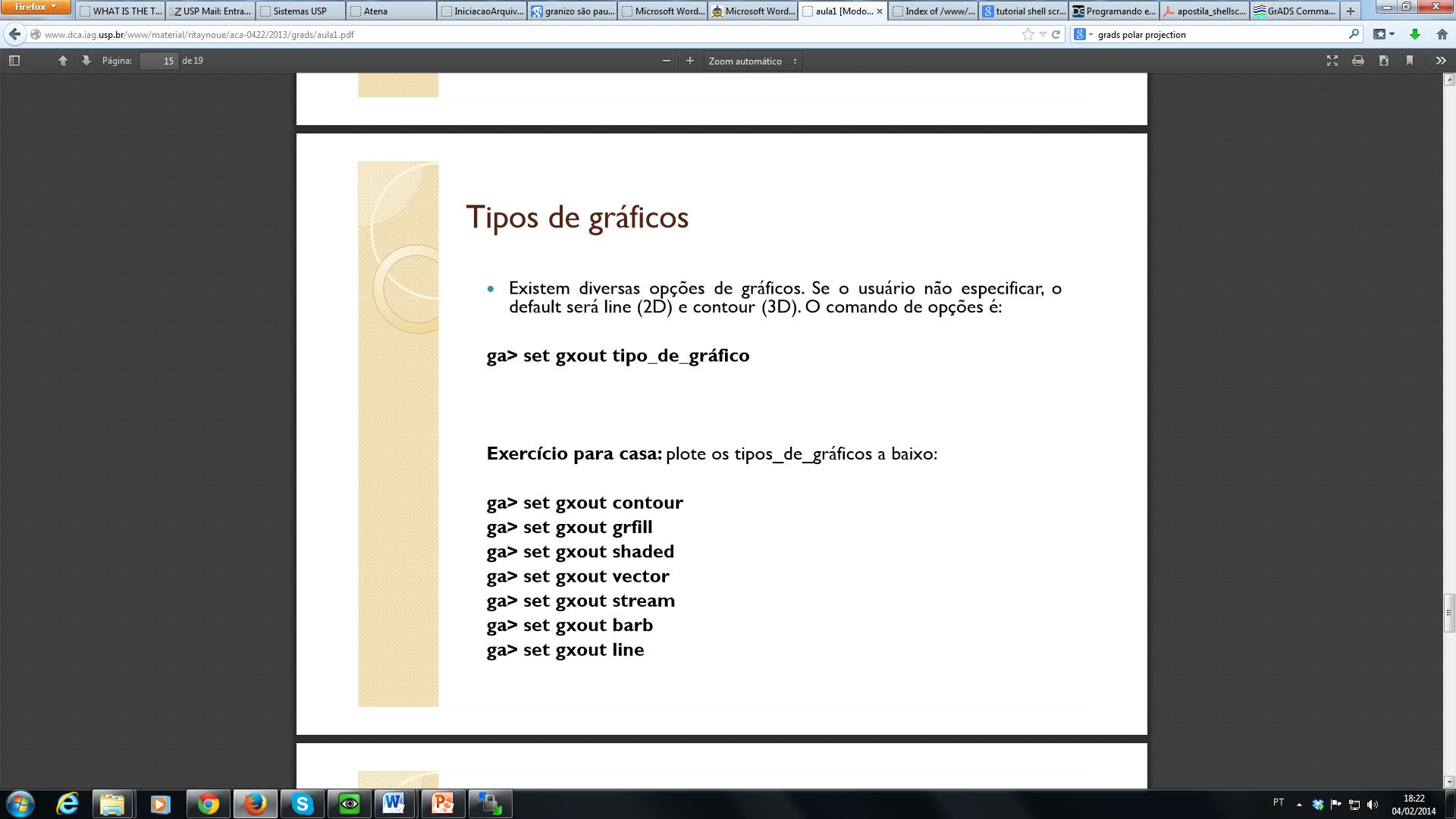
## Manipulando as dimensões: comando set

- O comando **set** especifica “quando” “onde” e “como” as variáveis serão plotadas:
- Quando → `ga> set t l`
- Onde → `ga> set lat -100 20`
- Como → `ga> set gxout shaded`

Tipos de **set**:

```
ga> set lat valorLAT1 valorLAT2
ga> set lon valorLON1 valorLON2
ga> set lev valorLEV1 valorLEV2
ga> set time valorT1 valorT2
```

Lembrando:  
 $-90^{\circ} < \text{LAT} < 90^{\circ}$   
 $-180^{\circ} < \text{LON} < 180^{\circ}$



## Tipos de gráficos

- Existem diversas opções de gráficos. Se o usuário não especificar, o default será line (2D) e contour (3D). O comando de opções é:

```
ga> set gxout tipo_de_gráfico
```

**Exercício para casa:** plote os tipos\_de\_gráficos a baixo:

```
ga> set gxout contour  
ga> set gxout grfill  
ga> set gxout shaded  
ga> set gxout vector  
ga> set gxout stream  
ga> set gxout barb  
ga> set gxout line
```

## Comando: define

- O comando **define** permite a criação de novas variáveis, conforme a sintaxe:

**ga> define nome-da-variavel = expressão**

Exemplo:

```
ga> define temp=t-273.15
ga> d temp
```

Não é necessário  
escrever toda hora  
t-273.15

# Grads

- *d msl* (d = display = mostrar) (msl = mean sea level pressure)
- *c* (clear = limpar)
- *set lon -180 180* (deixar long 0 no meio)
- *d msl*
  - Qual a unidade desta variável?
  - Tente outro tipo de gráfico (*set gxout shaded*)
- *c*
- *set gxout shaded*
- *d msl*

# Grads

– Visualize as outras variáveis:

- *d u10*

- *d v10*

- *d t2m*

– Veja o vento na forma de vetor:

- *d u10;v10*

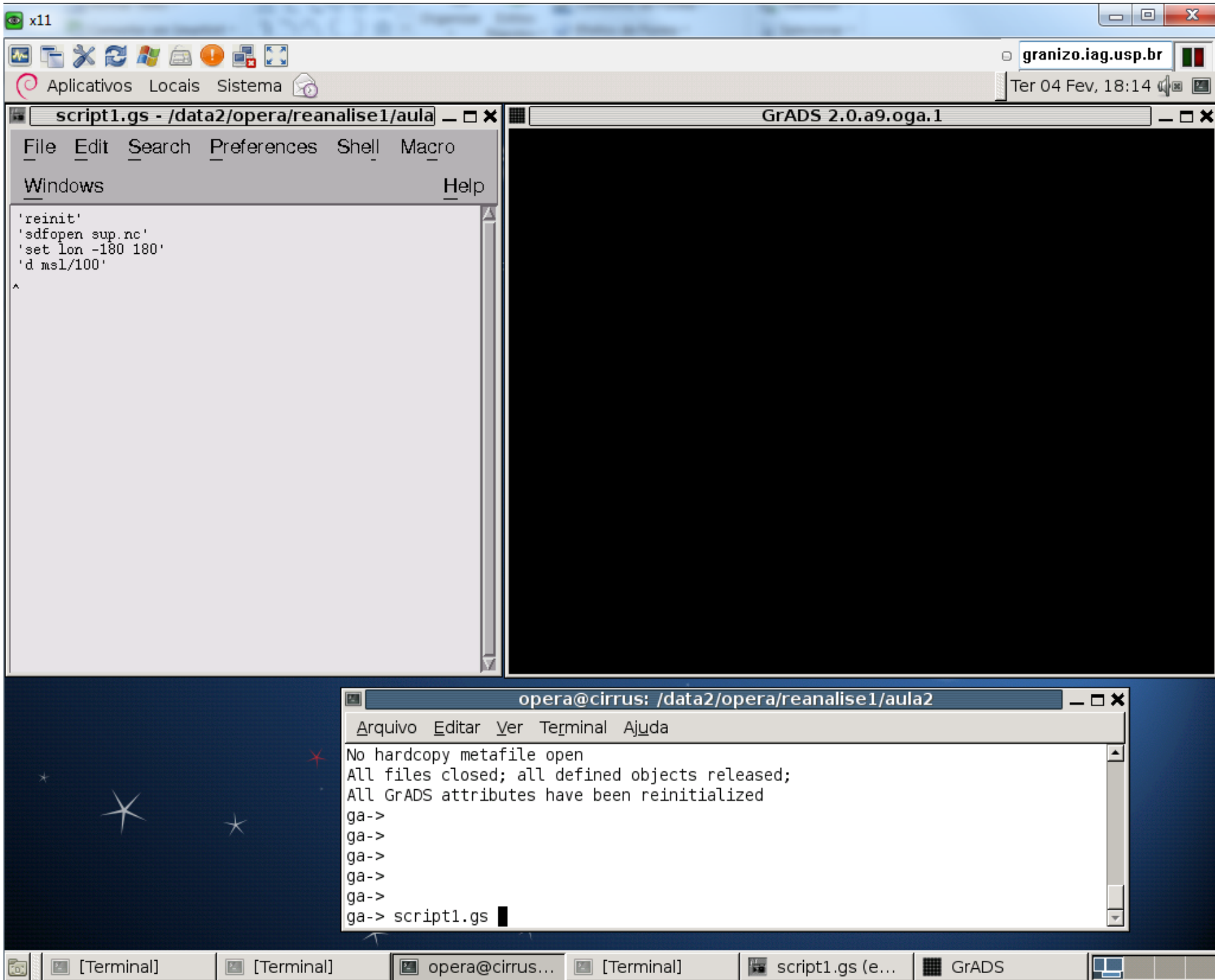
– Use o comando skip

- *set t 2 (t 1 = janeiro/2011; t 2 = julho/2011)*



# Script do grads

- Abrir um outro terminal de comandos
- *nedit script1\_MEUNOME.gs &->* abre o arquivo “script1\_MEUNOME.gs” em um editor de texto
- & -> no final do comando, deixa disponível o prompt de comando
- Dentro do editor de texto: colocar os mesmos comandos do grads, mas entre apóstrofes, por exemplo:
  - ‘sdfopen sup.nc’
  - ‘set lon -180 180’
  - ‘d msl/100’



# Exercício 1

- Escreva no script os comandos para mostrar a pressão reduzida ao nível médio do mar (em hPa) com intervalos de 4hPa (shaded e depois contour) e o vento horizontal em janeiro de 2011 para a região compreendida entre
  - Latitudes: 90oS e 0o
  - Longitudes: 90oW e 20oE

# Exercício 2

- Escreva no script os comandos que mostram a temperatura (em °C) com intervalos de 5°C (shaded e contour) e as linhas de corrente (na cor preta) em julho de 2011 para a região compreendida entre
  - Latitudes: 40°N e 40°S
  - Longitudes: 20°E e 150°E

# Exercício 3

- Escreva no script os comandos para calcular a diferença da temperatura (em °C, intervalo de 5°C) entre janeiro e julho de 2011 para todo o domínio (shaded e contour).

# Envie o script

- Envie o script1\_MEUNOME.gs para o e-mail:
- [sinoticaiaig@gmail.com](mailto:sinoticaiaig@gmail.com)

# Coordenadas esféricas

- Para a próxima aula leia o texto:
- <http://www.met.wau.nl/education/atd/Practical..unit%202/Coord.html>
- E a explicação do comando cdiff do Grads:
- <http://www.met.wau.nl/education/atd/Practical..gadoc/gradfunccdiff.html>

# Exercício 4

- Procure ou escreva os scripts para:
- Calcular o gradiente de temperatura
- Calcular a advecção de temperatura
- Plotar:
  - Advecção de temperatura (shaded)
  - Temperatura (contour)
  - Vento (vetor)



# Exercício 5

- Calcular o gradiente de pressão horizontal
- Calcular o vento geostrófico utilizando a definição:

$$\begin{aligned} f \cdot v &= \frac{1}{\rho} \frac{\partial P}{\partial x} \\ f \cdot u &= -\frac{1}{\rho} \frac{\partial P}{\partial y} \end{aligned}$$

- Suponha densidade = 1 kg.m<sup>-3</sup>
- Plote o vento geostrófico, o vento e a pressão reduzida ao nível médio do mar.