

EXERCISE 0

Flexpart by hand → without a computer 😊

Aims:

1. Thinking process to set-up a Flexpart run
2. Understand the files to be modified
3. Understand what information is needed to run Flexpart

Prepare a pen

Questions? Write delia.arnold-arias@zamg.ac.at

Dukovany NPP (49.0845 N / 16.1469 E) accident during night-time T0 -20180905 000000 UTC

**Is the situation dangerous
for the highly populated
area of Vienna?**



Plants

Unit	Type	Thermal power	Electric power	Status (3/2011)	Start-up	Shut-down
1	<u>PWR Gidropress 6-loop VVER 440/213</u>	1375 MW	456 MW	in operation	1985	exp. 2045
2	<u>PWR Gidropress 6-loop VVER 440/213</u>	1375 MW	456 MW	in operation	1986	exp. 2046
3	<u>PWR Gidropress 6-loop VVER 440/213</u>	1375 MW	456 MW	in operation	1986	exp. 2046
4	<u>PWR Gidropress 6-loop VVER 440/213</u>	1375 MW	456 MW	in operation	1987	exp. 2047

- Maps to:
 - Understand locations
 - Guide the domain definition
- Input files:
 - OUTGRID
 - COMMAND
 - RELEASES
 - List of SPECIES
- Guiding questions and discussion questions

Results:

- Is a single set-up the only possibility for an event? No. Set-up and trade-offs depend on what we want to answer. For example:
 - Do we want time series at receptors to understand measurements?
 - How far are we from the source?
 - What domains have we chosen?
 - What time steps?
 - What species have we used?
 - What meteorological information to use
 - Number of particles? More → slower, less → faster (but more uncertain)
 - How many vertical levels? Am I only interested at the lower level (where people live?)
 - Do we use adaptative timesteps according to TL?
 -

RELEASES

```
&RELEASES_CTRL
  NSPEC=          1,
  SPECNUM_REL=    21,
  /
&RELEASE
  IDATE1= 20180905,
  ITIME1=          0,
  IDATE2= 20180905,
  ITIME2= 30000,
  LON1= 16.1469002 ,
  LON2= 16.1469002 ,
  LAT1= 49.0844994 ,
  LAT2= 49.0844994 ,
  Z1= 0.00000000 ,
  Z2= 50.0000000 ,
  ZKIND= 1,
  MASS= 9.99999984E+16,
  PARTS= 100000,
  COMMENT="Dukovany
",
/
```

OUTGRID

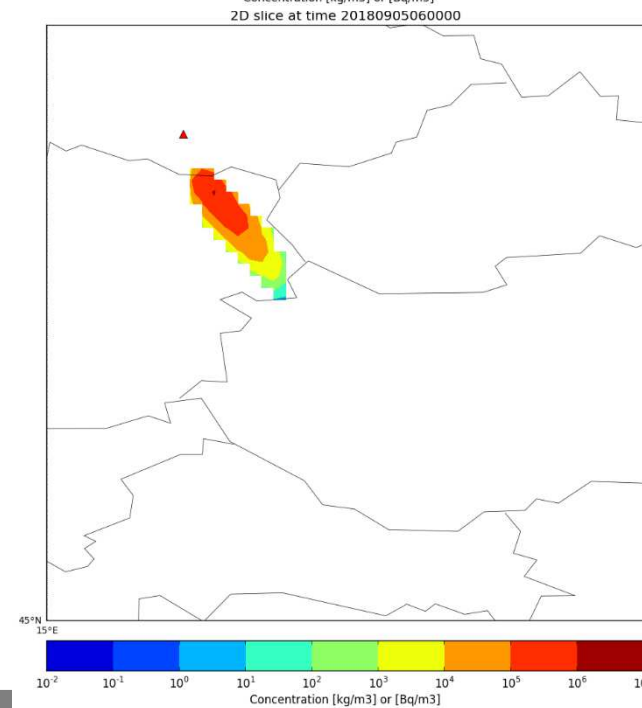
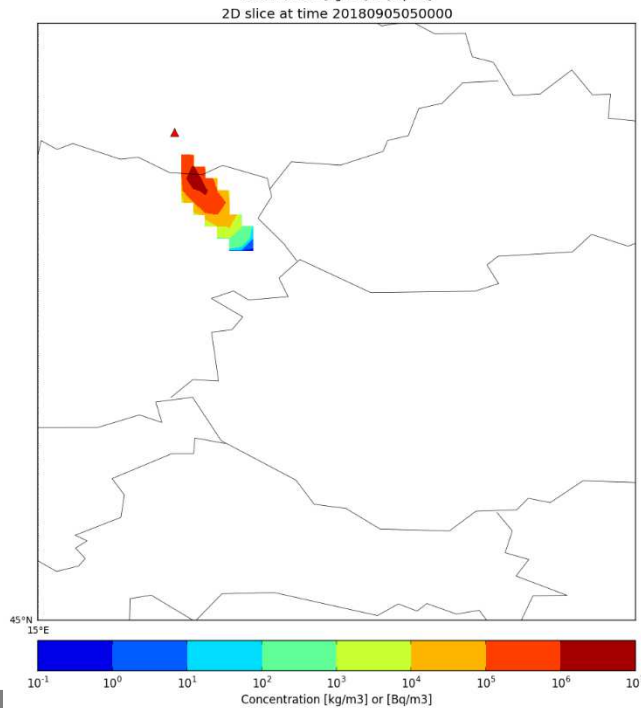
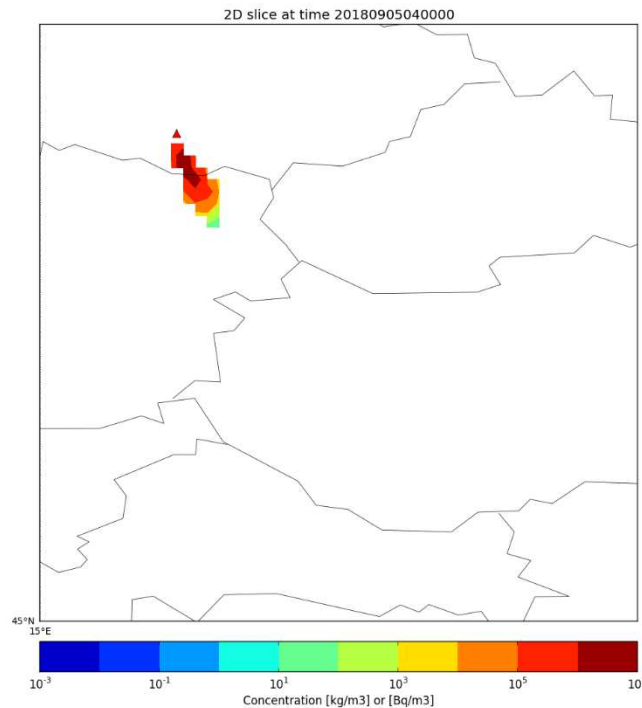
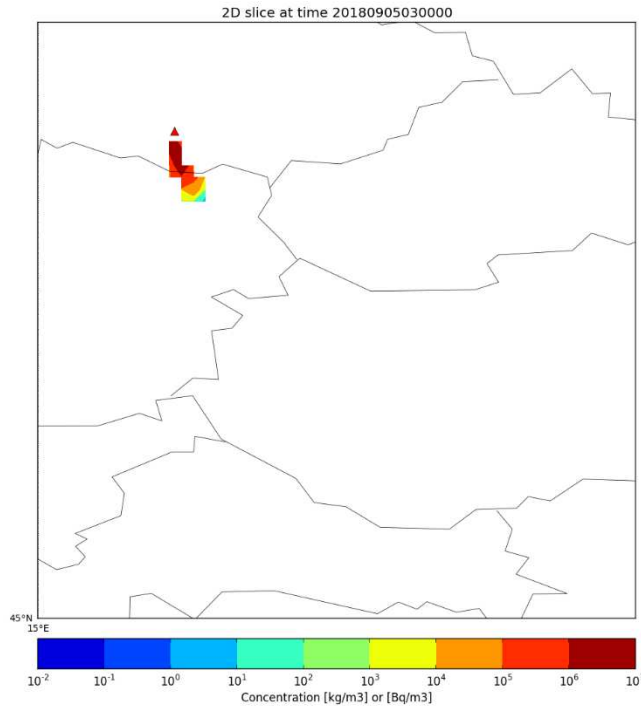
```
&OUTGRID
  OUTLON0= -30.0000000 ,
  OUTLAT0= 30.0000000 ,
  NUMXGRID= 700,
  NUMYGRID= 450,
  DXOUT= 0.100000001 ,
  DYOUT= 0.100000001 ,
  OUTHEIGHTS= 100.000000 ,
/
```

COMMAND

```
&COMMAND
  LDIRECT=          1,
  IBDATE= 20180905,
  IBTIME=          0,
  IEDATE= 20180905,
  IETIME= 60000,
  LOUTSTEP= 3600,
  LOUTAVER= 3600,
  LOUTSAMPLE= 900,
  ITSPLIT= 9999999,
  LSYNCTIME= 900,
  CTL= -5.00000000 ,
  IFINE= 4,
  IOUT= 1,
  IPOUT= 0,
  LSUBGRID= 0,
  LCONVECTION= 0,
  LAGESPECTRA= 0,
  IPIN= 0,
  IOUTPUTFOREACHRELEASE= 0,
  IFLUX= 0,
  MDOMAINFILL= 0,
  IND_SOURCE= 1,
  IND_RECEPTOR= 1,
  MQUASILAG= 0,
  NESTED_OUTPUT= 0,
  LINIT_COND= 0,
  LNETCDFOUT= 0,
  SURF_ONLY= 0,
  CBLFLAG= 0,
  OHFIELDS_PATH="../../flexin/
",
/
```

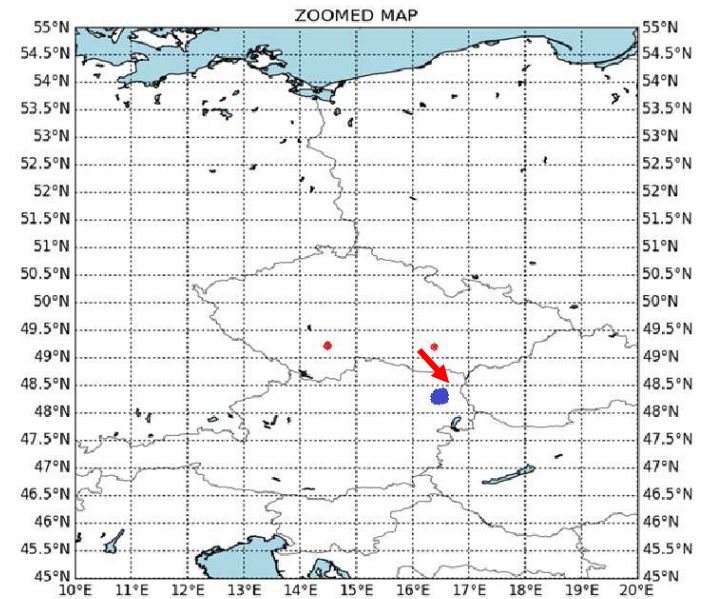
Hourly output

Example results – what do we see?



Concentration at ground level

Vienna reached 5 hours after
the initiation of the release



What if it was Temelin?

