

# EXERCISE 0

Flexpart by hand → without a computer 😊

Aims:

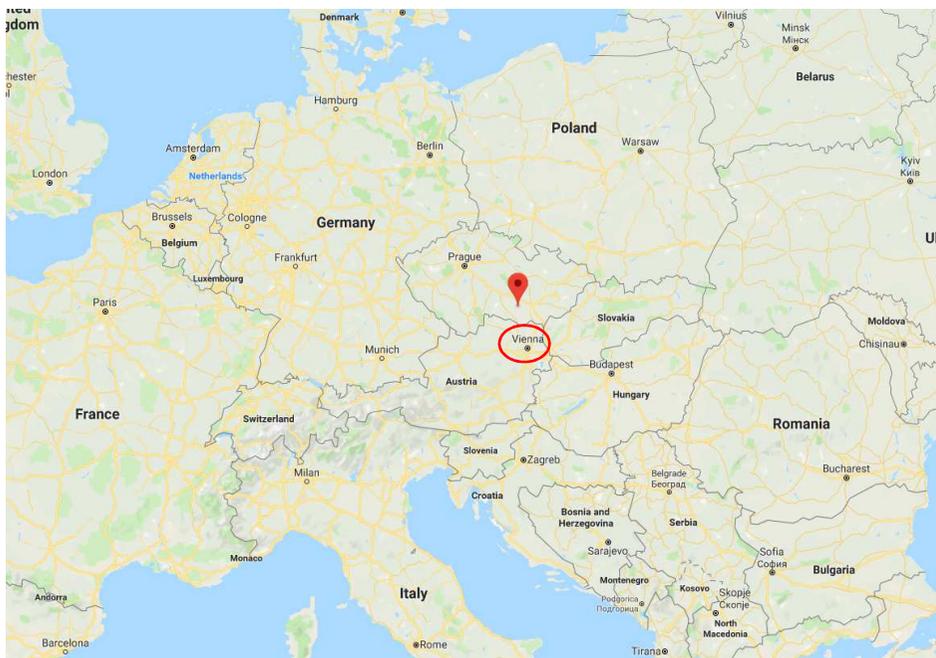
1. Thinking process to set-up a Flexpart run
2. Understand the files to be modified
3. Understand what information is needed to run Flexpart

*Prepare a pen*

Questions? Write [delia.arnold-arias@zamg.ac.at](mailto: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	<a href="#">PWR Gidropress 6-loop VVER 440/213</a>	1375 MW	456 MW	in operation	1985	exp. 2045
2	<a href="#">PWR Gidropress 6-loop VVER 440/213</a>	1375 MW	456 MW	in operation	1986	exp. 2046
3	<a href="#">PWR Gidropress 6-loop VVER 440/213</a>	1375 MW	456 MW	in operation	1986	exp. 2046
4	<a href="#">PWR Gidropress 6-loop VVER 440/213</a>	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 ,
/
```

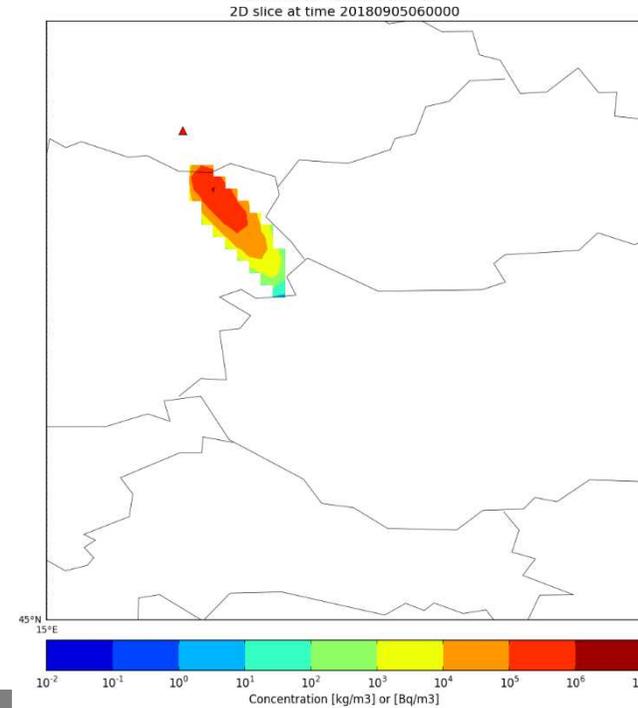
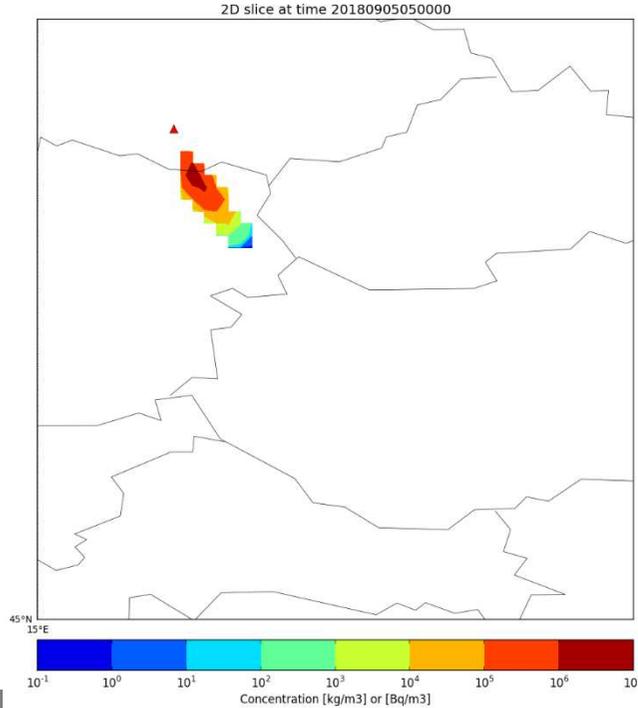
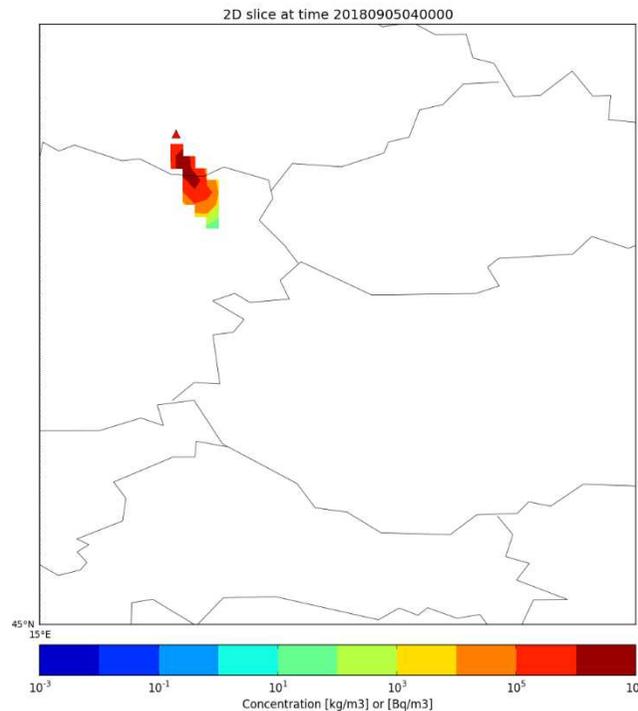
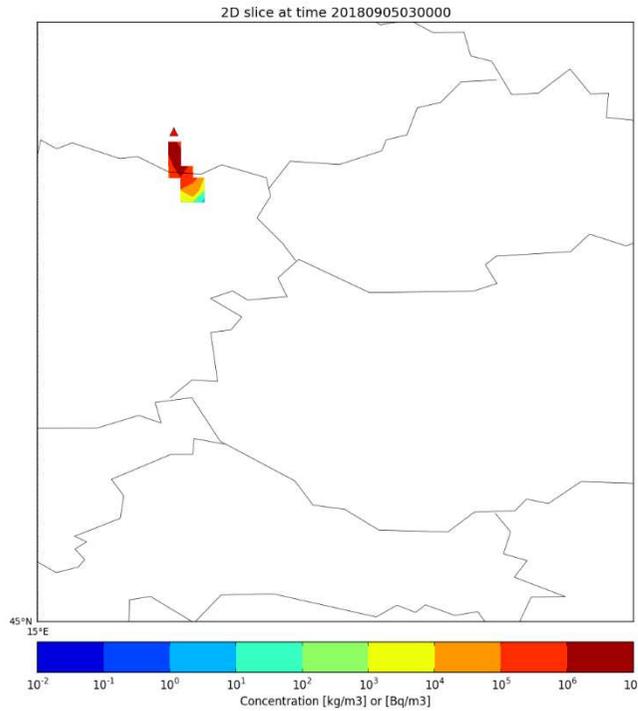
## COMMAND

### &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/
",
/
```

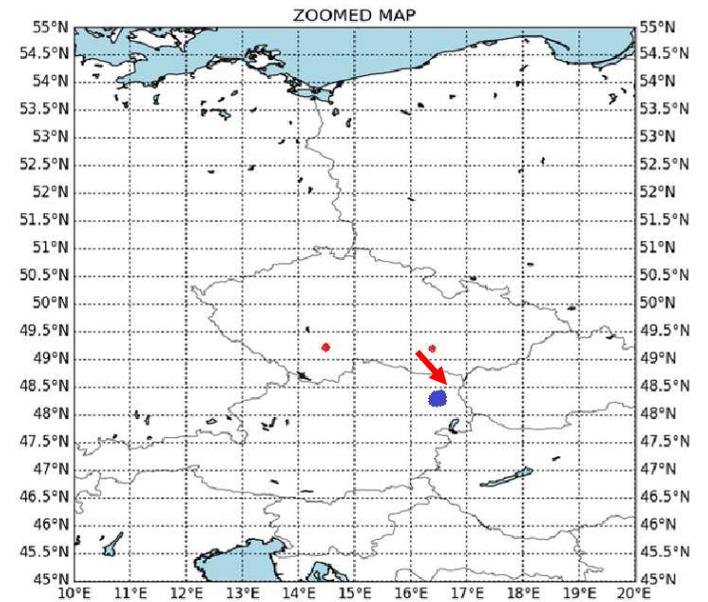
Hourly output

# Example results – what do we see?



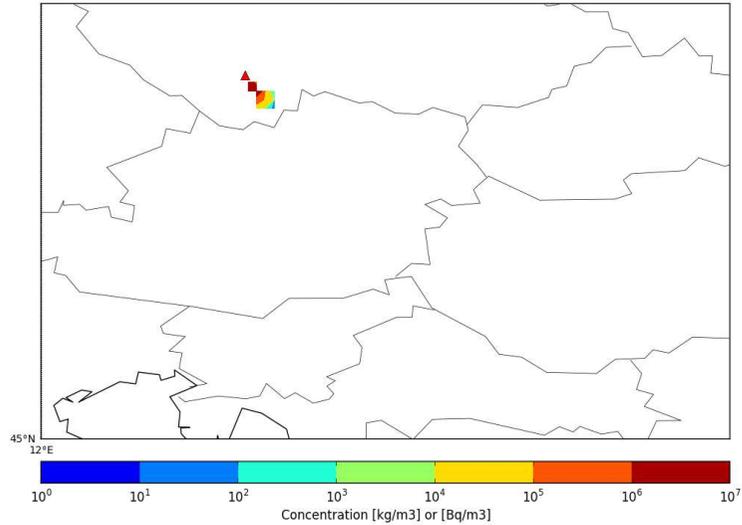
Concentration at ground level

Vienna reached 5 hours after the initiation of the release

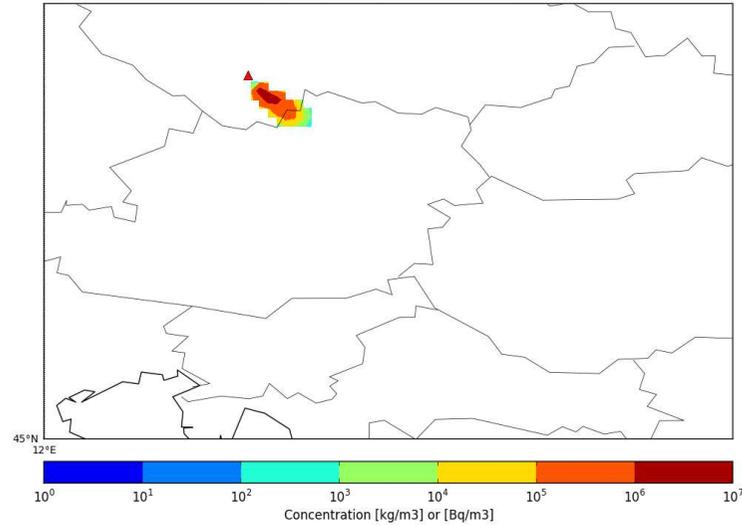


# What if it was Temelin?

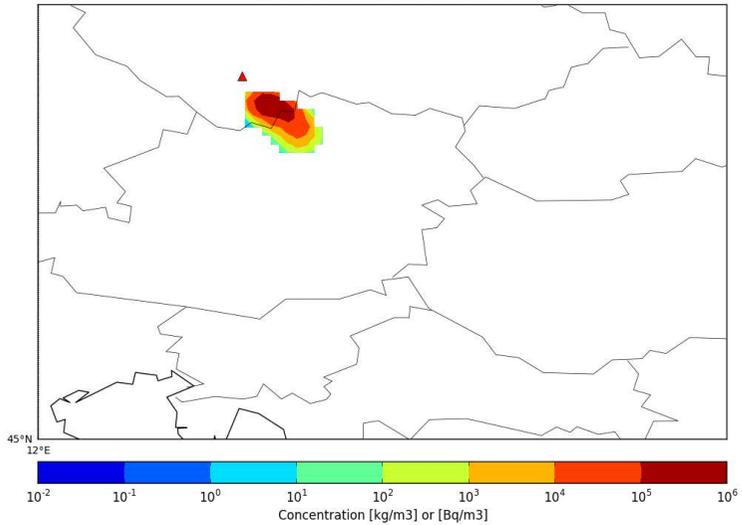
2D slice at time 20180905030000



2D slice at time 20180905060000



2D slice at time 20180905080000



2D slice at time 20180905120000

