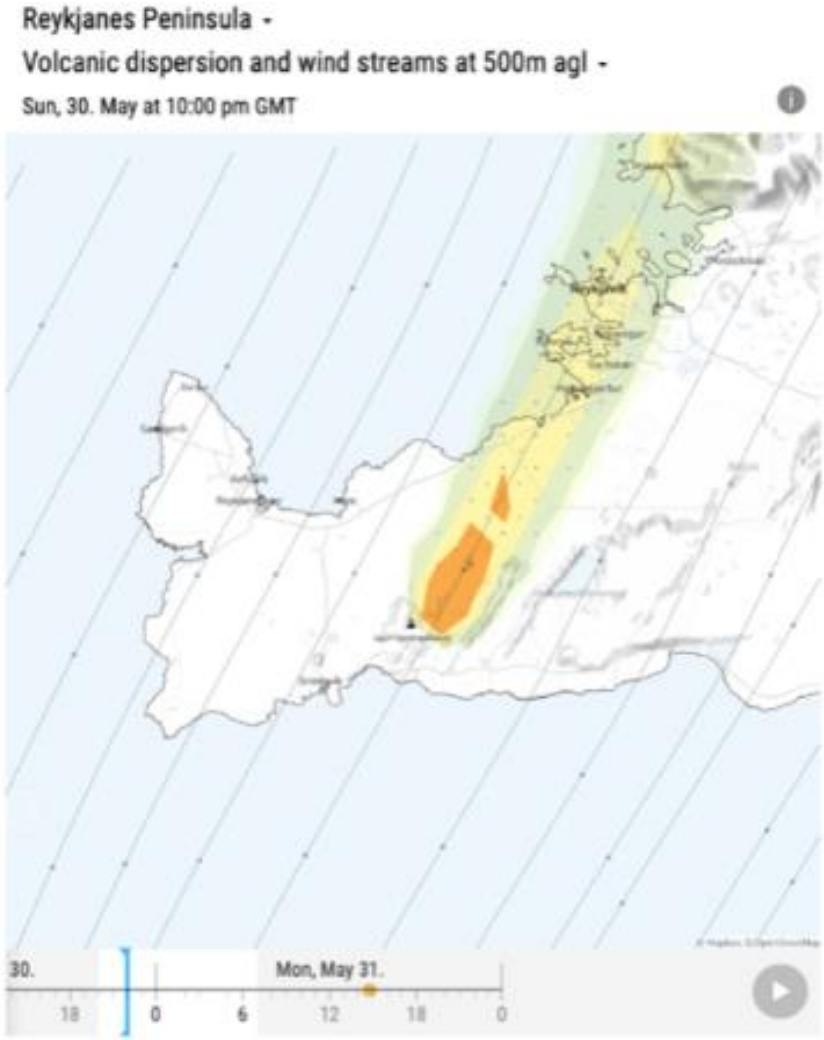
Simulating trace gases from the Fagradalsfjall volcanic eruption in SW-Iceland

A “visual validation” of the simulations



WRF-Chem V4.3

3km horizontal resolution

42 vertical levels

model top at 100hPa

401x401 pts. in the horizontal

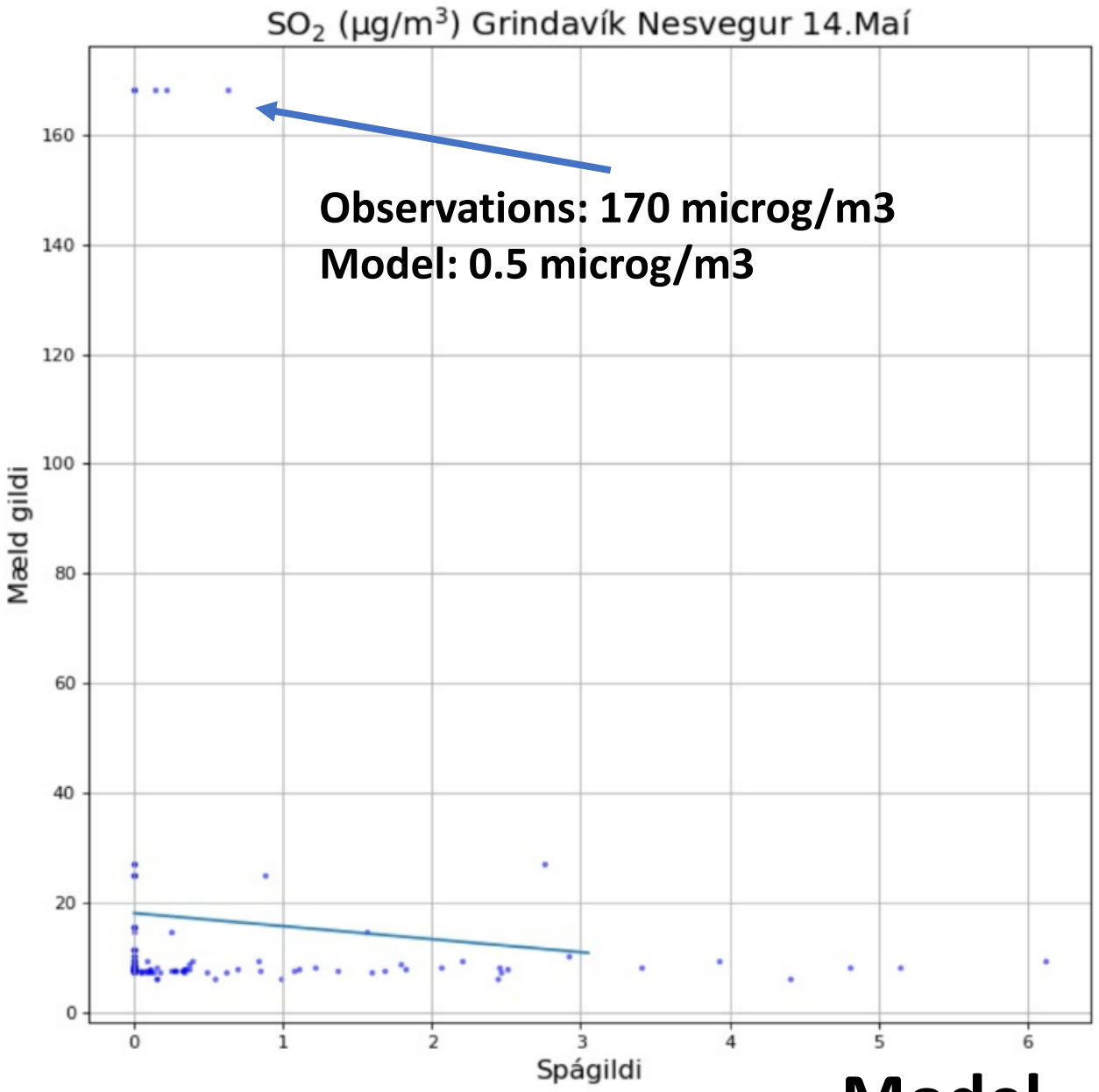
updated every two hours, forecast goes out to 21 hours

initial and boundary data come from the RAP forecasting system run by NOAA

Distribution of existing air quality sites. Sites report SO2, and wind speed. Operated by the Icelandic Environment Agency

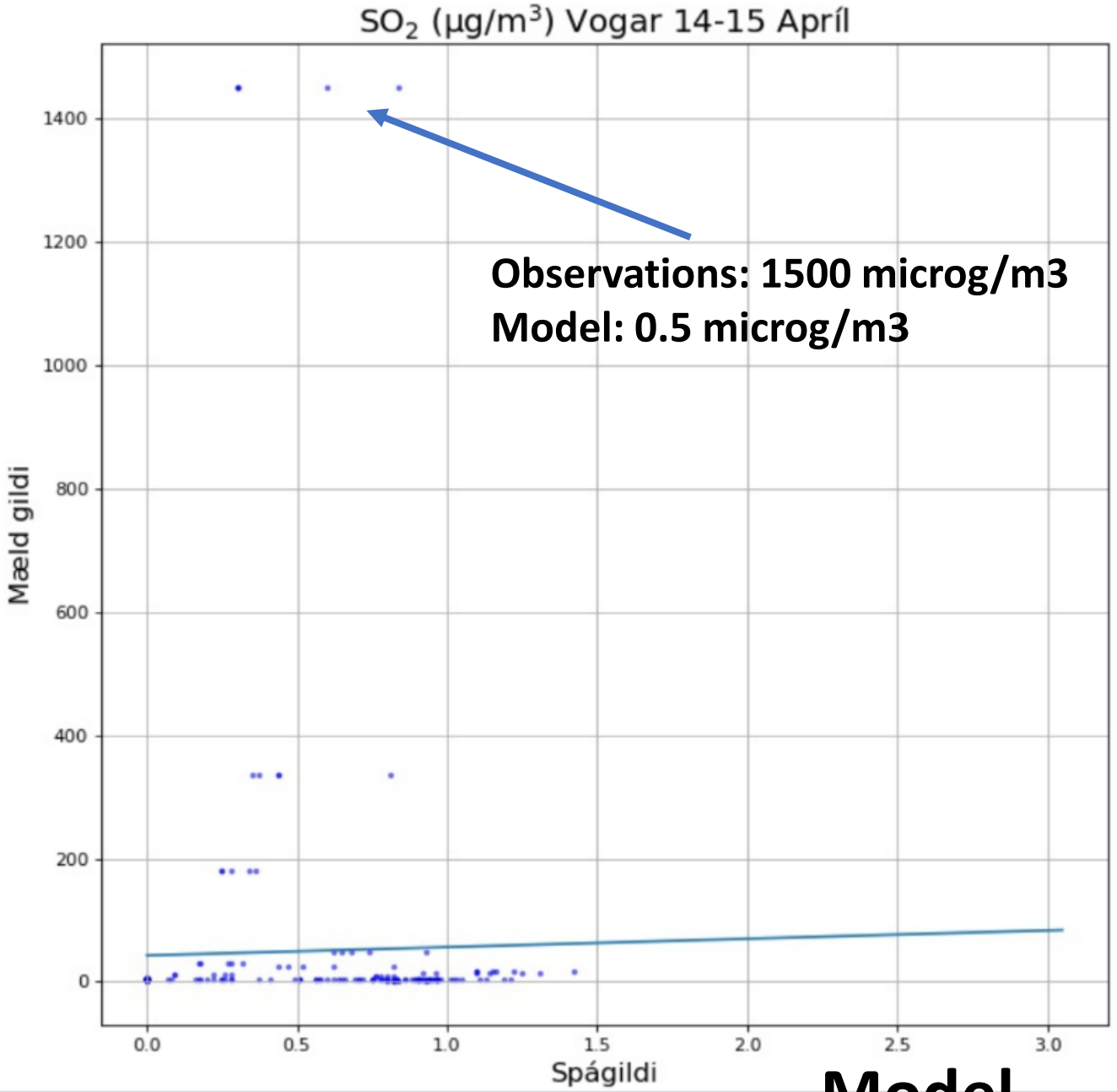
A few examples of point comparison between observed and simulated SO2

Obs


SO2 (µg/m3) Grindavík Nesvegur 14.Maí
Observations: 170 microg/m3
Model: 0.5 microg/m3
Mæld gildi
Spágildi
0
20
40
60
80
100
120
140
160
0
1
2
3
4
5
6

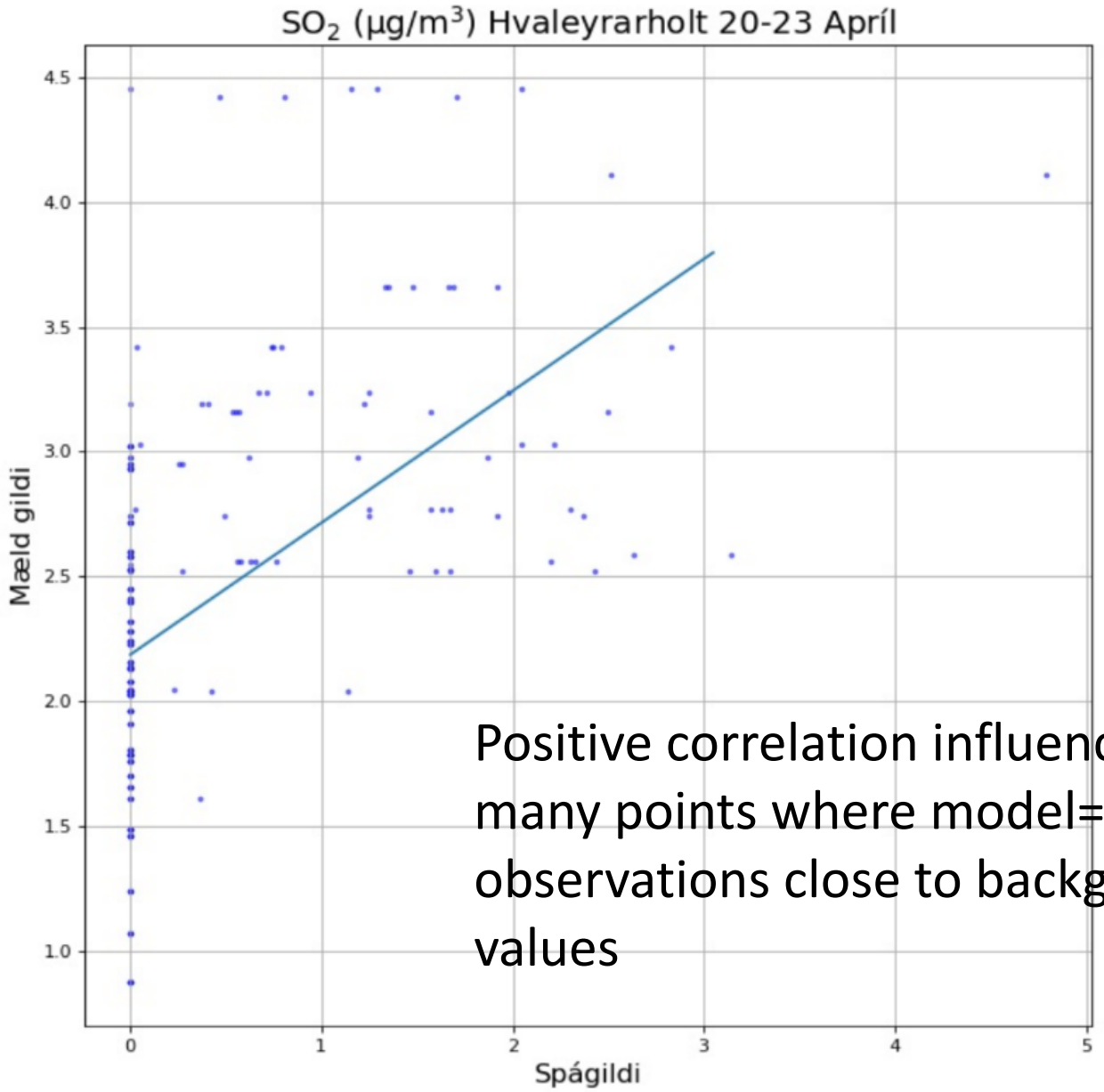
Model

Obs


SO2 (µg/m3) Vogar 14-15 Apríl
Observations: 1500 microg/m3
Model: 0.5 microg/m3
Mæld gildi
Spágildi
0
200
400
600
800
1000
1200
1400
0.0
0.5
1.0
1.5
2.0
2.5
3.0

Model

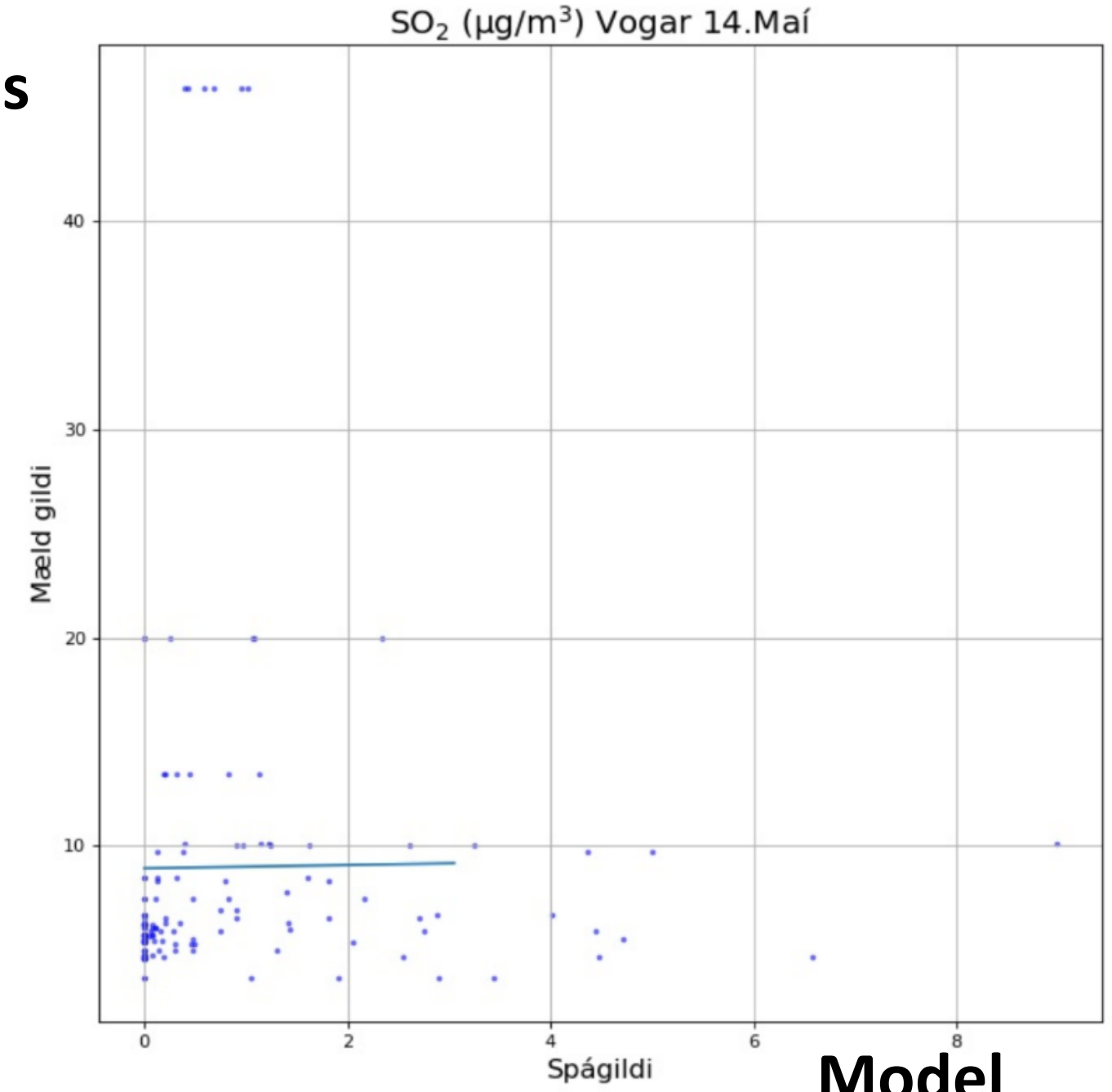
Obs



Positive correlation influenced by many points where model=0 and observations close to background values

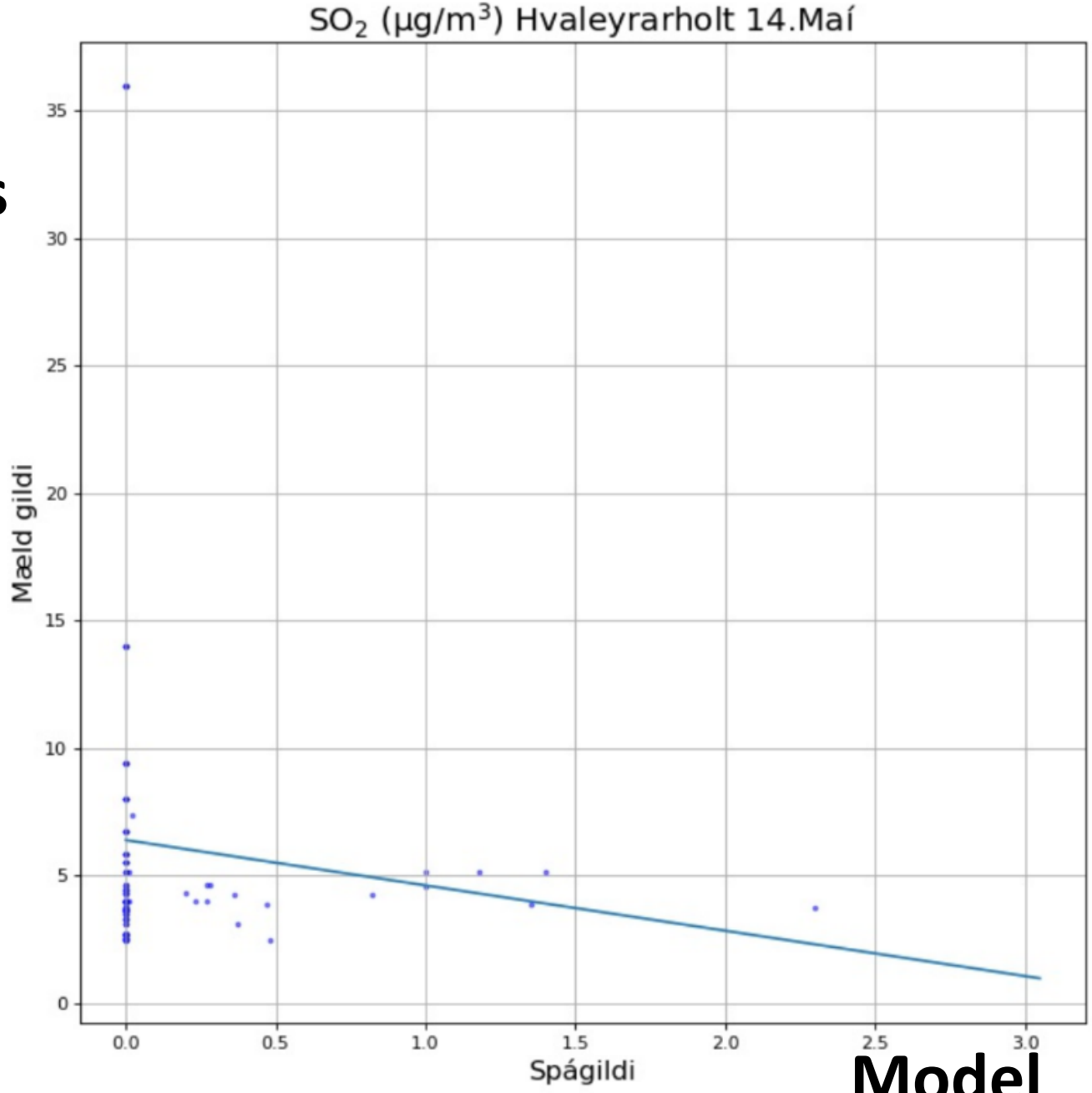
Model

Obs



Model

Obs

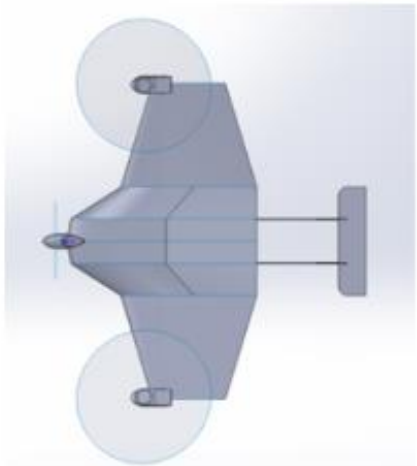

SO_2 (µg/m^3) Hvaleyrarholt 14.Maí
Mæld gildi
Spágildi
0
5
10
15
20
25
30
35
0.0
0.5
1.0
1.5
2.0
2.5
3.0

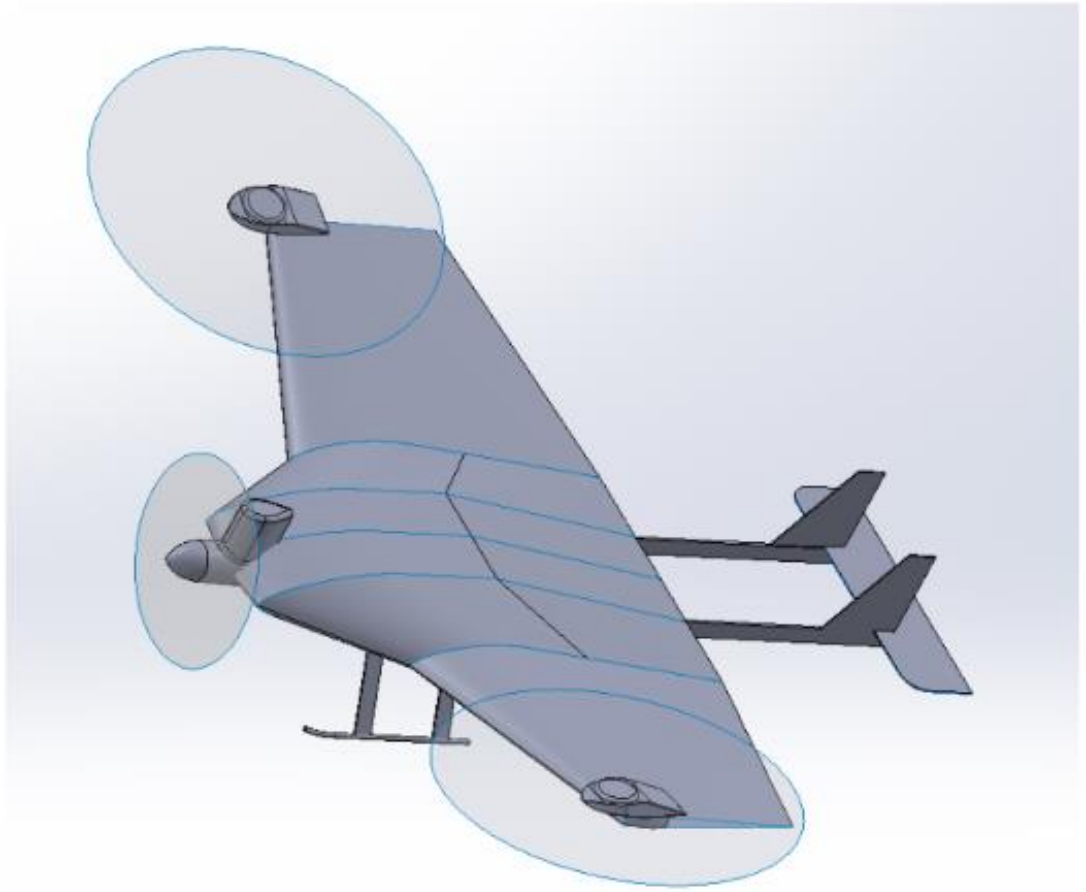
Model

Key points

- Point observations 20-30 km away from the source are of limited use to validate simulations of SO2
- Better horizontal coverage, and preferably a complete 4D coverage with high temporal resolution is what we need, and that is what we aim at doing

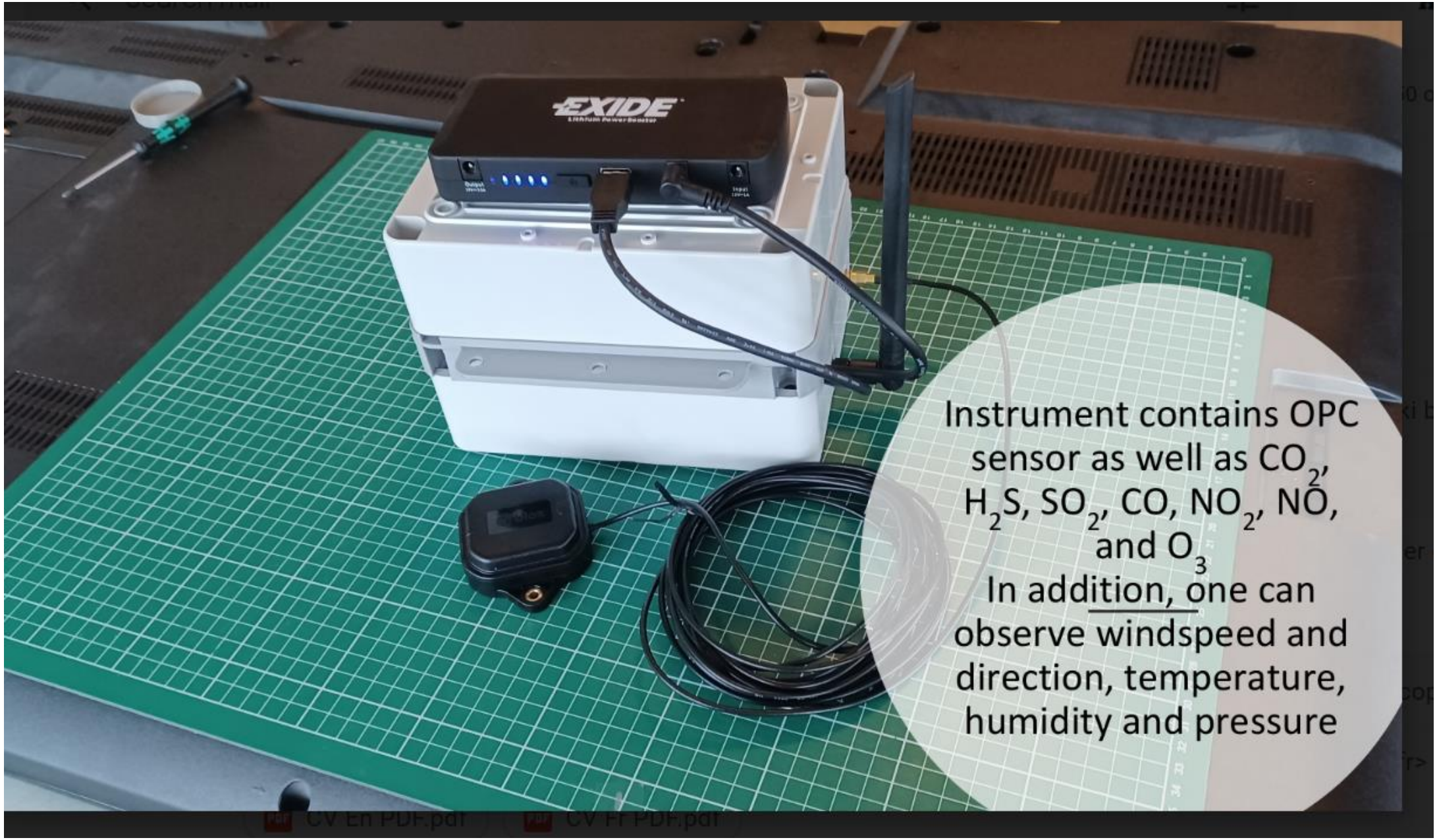
The “Hoppari” UAV from ThereCraft Ltd. is expected to take to the air in summer of 2022





Main feature include:

- Six hour flight-time
- 4.5kg cargo capacity
- Vertical take-off and landing
- Fully autonomous


EXIDE
Lithium Power Booster
Instrument contains OPC sensor as well as CO_2, H_2S, SO_2, CO, NO_2, NO, and O_3
In addition, one can observe windspeed and direction, temperature, humidity and pressure