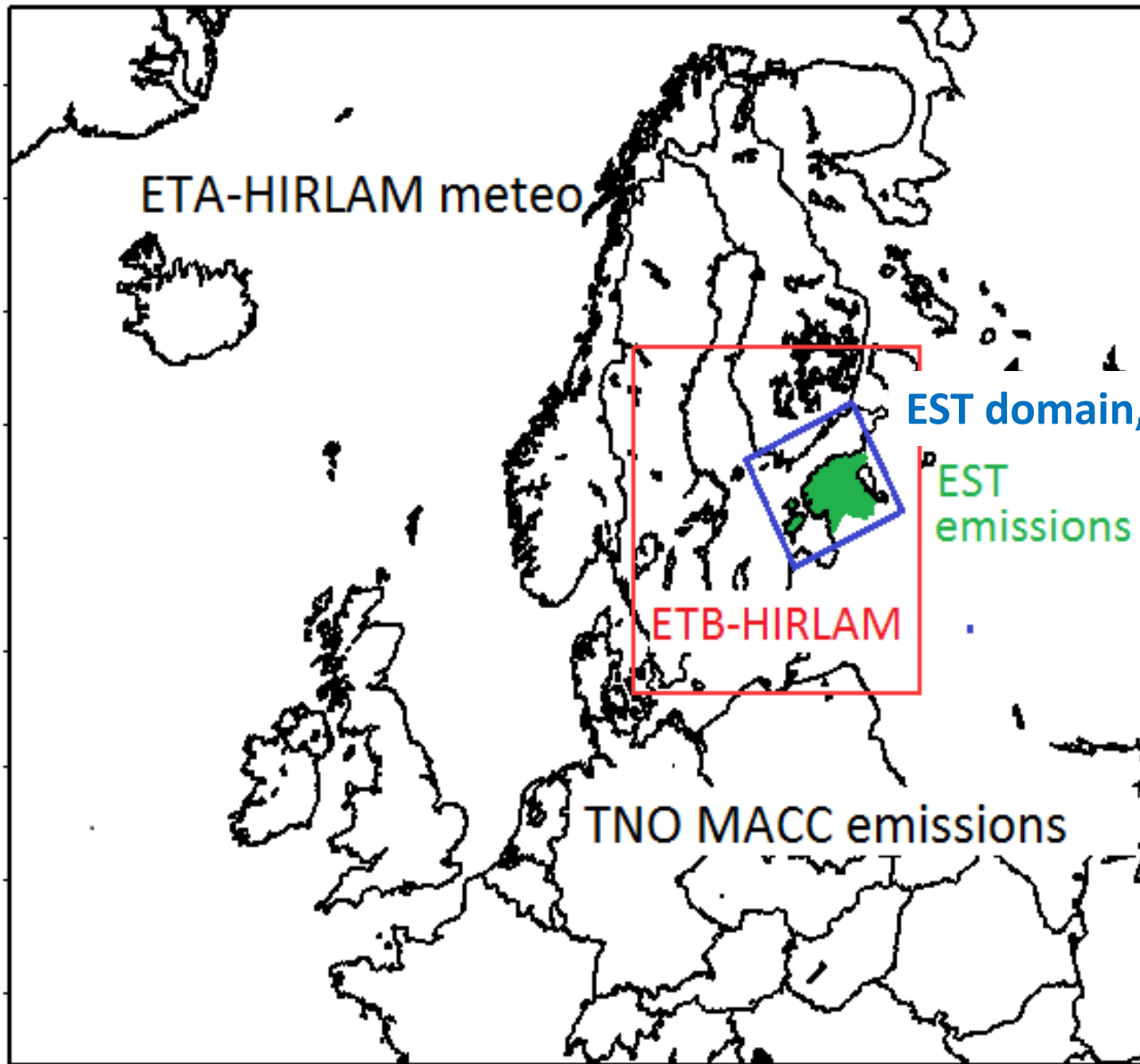


Performance of SILAM air quality model in winter anticyclone

Marko Kaasik,

Ardi Loot, Riinu Ots

University of Tartu, Estonia



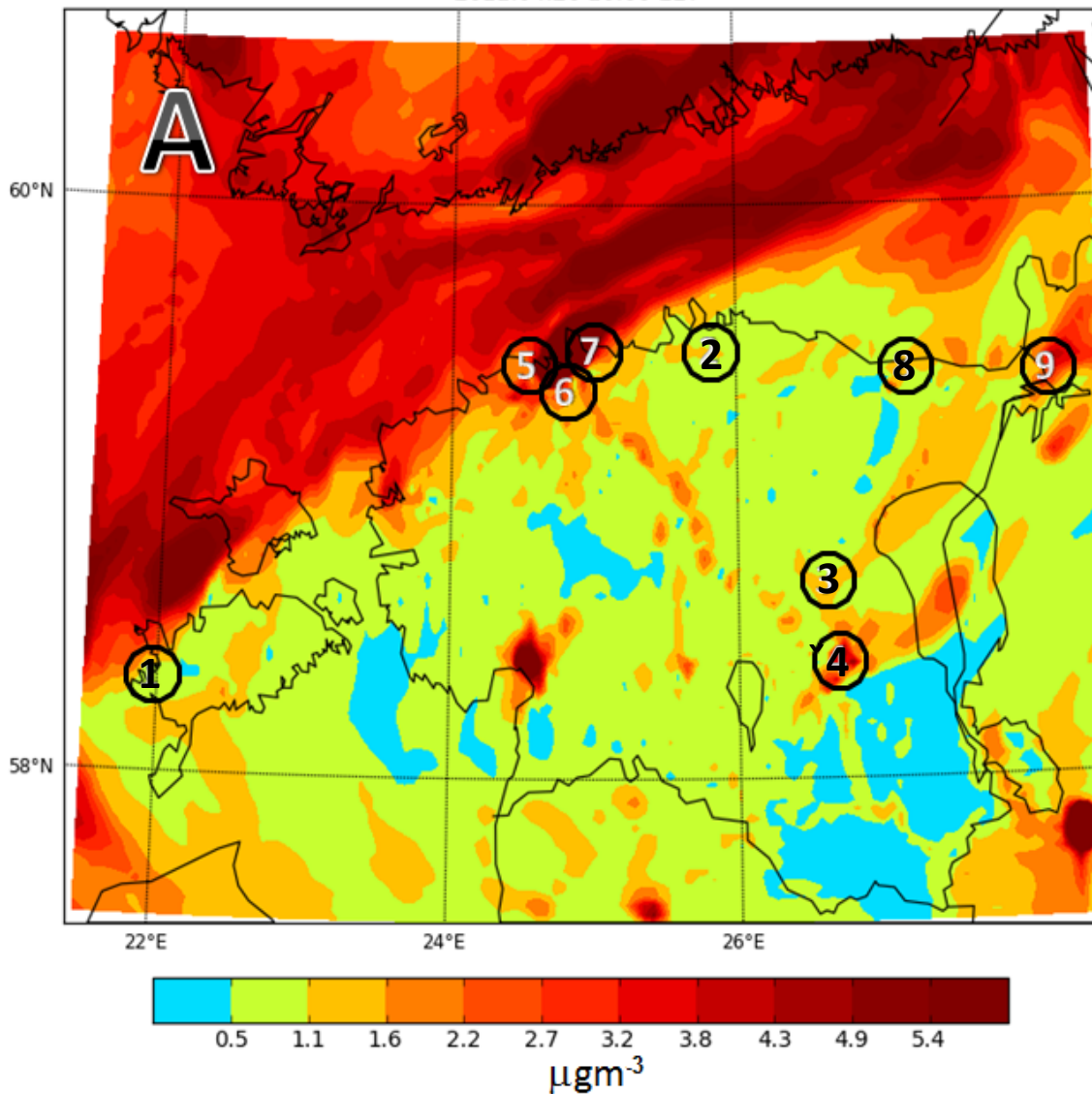
SILAM 5.1

Experimental configuration

EST emissions provided by Estonian Environmental Research Centre:

- over 2000 point sources, most of them industrial stacks and boiler houses;
- emissions from 5000 km of streets and roads;
- gridded emissions from domestic heating – bottom-up method.
- * Final urban emission resolution is 0.5 and rural 1.0 km.
- * MACC emissions: resolution 7 km.
- * Yearly, daily and weekly cycles.

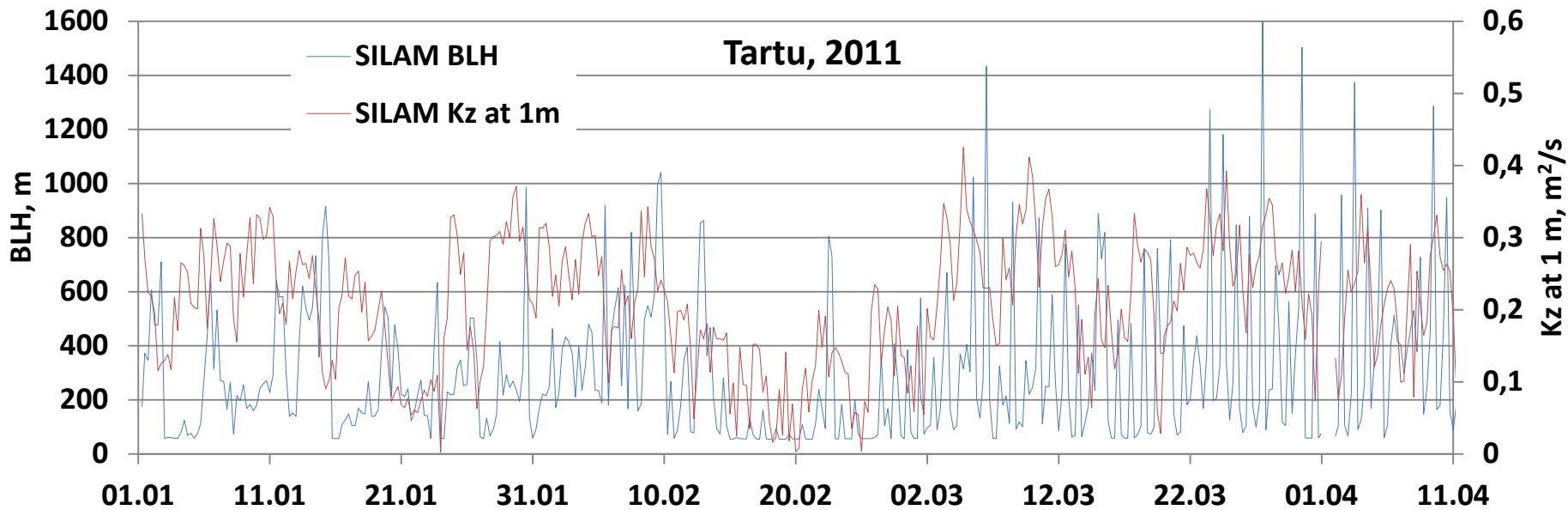
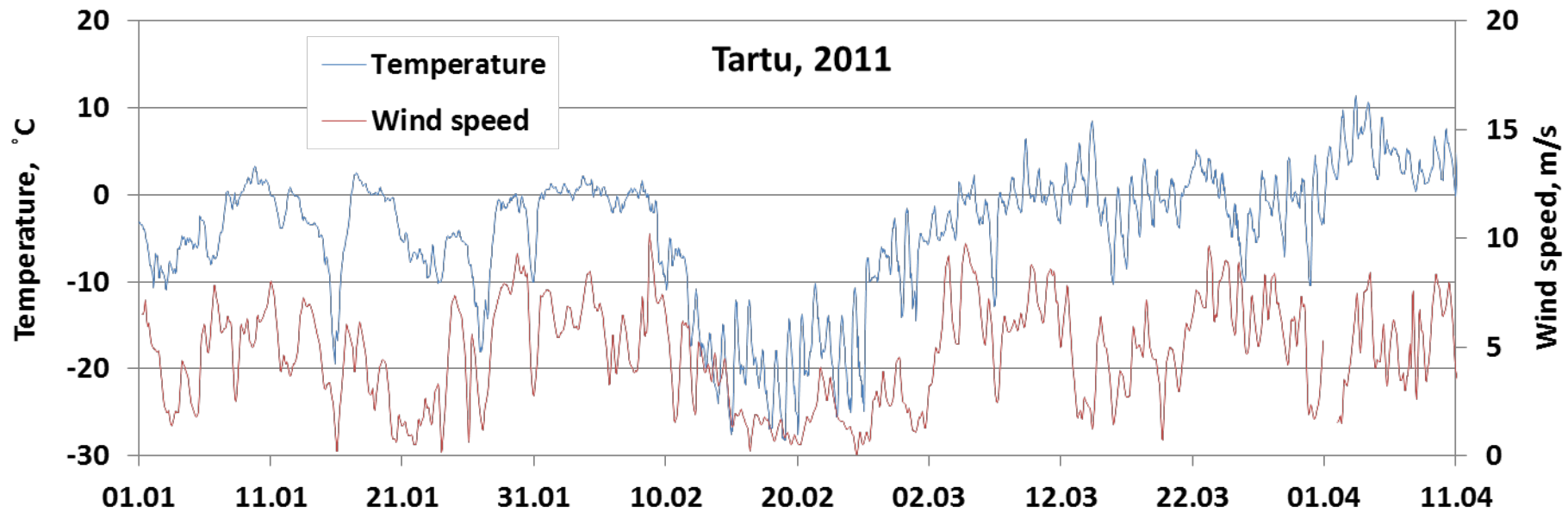
2011.04.26 10:00 EET

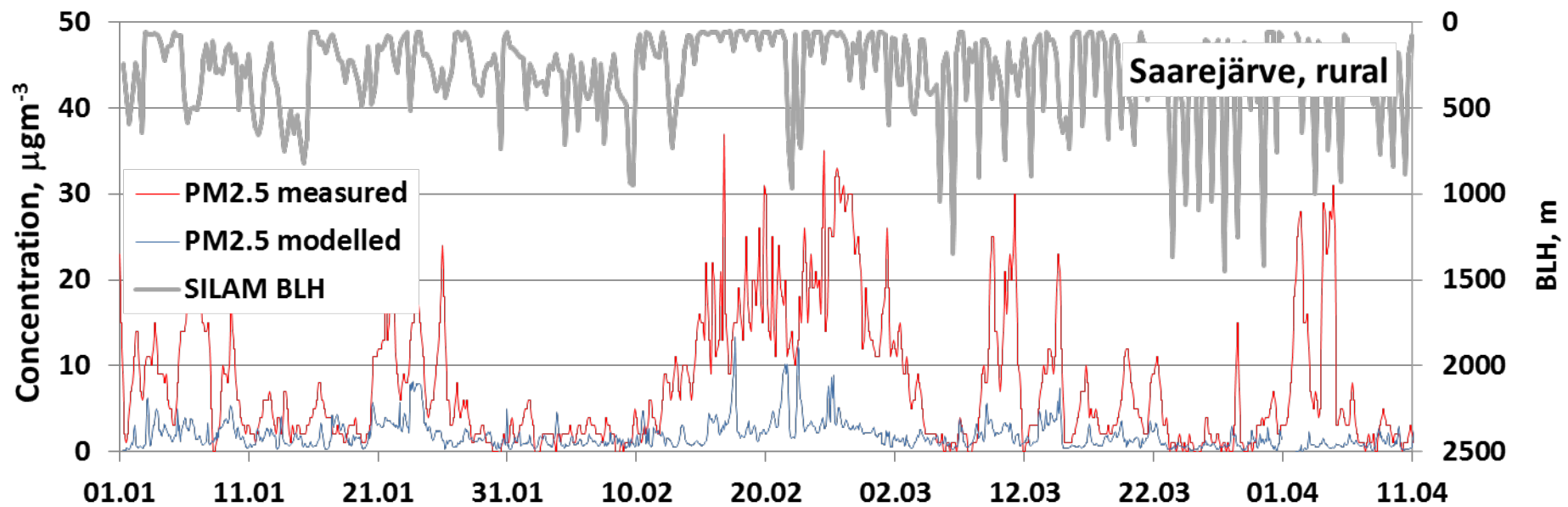
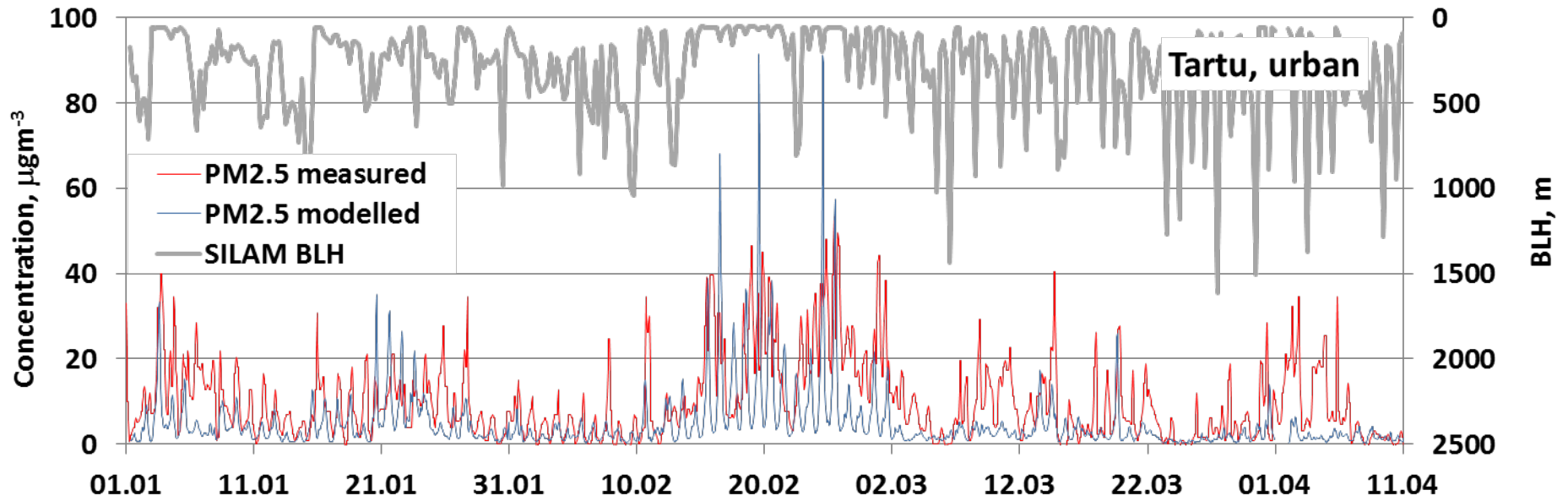


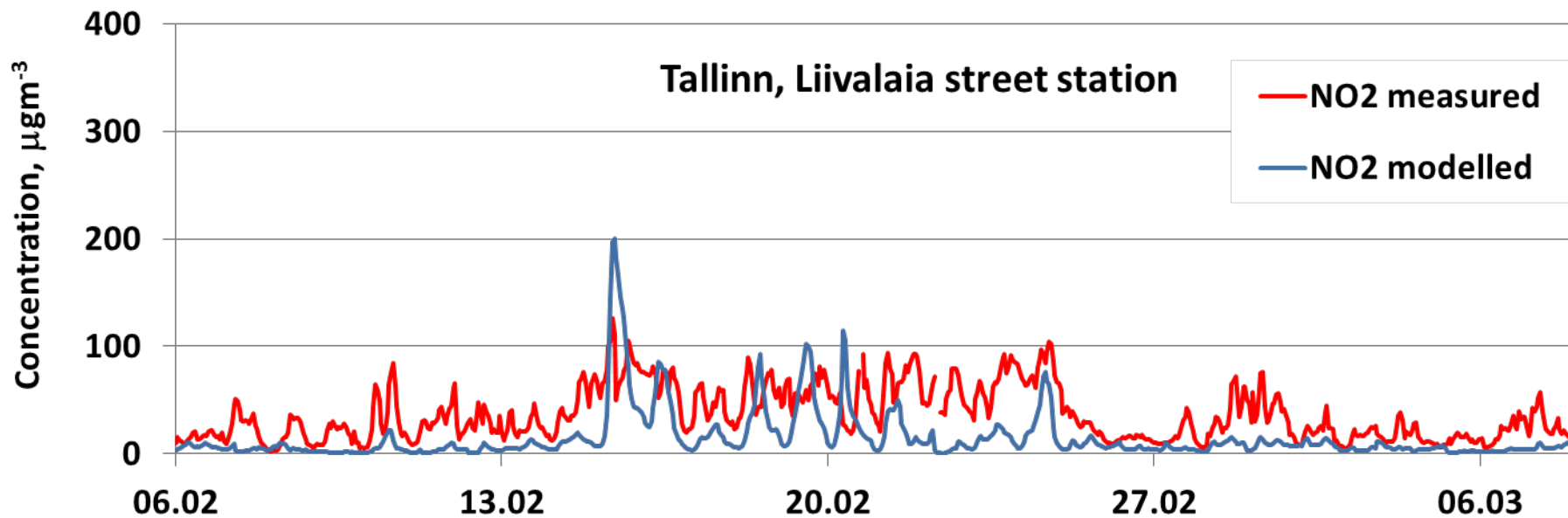
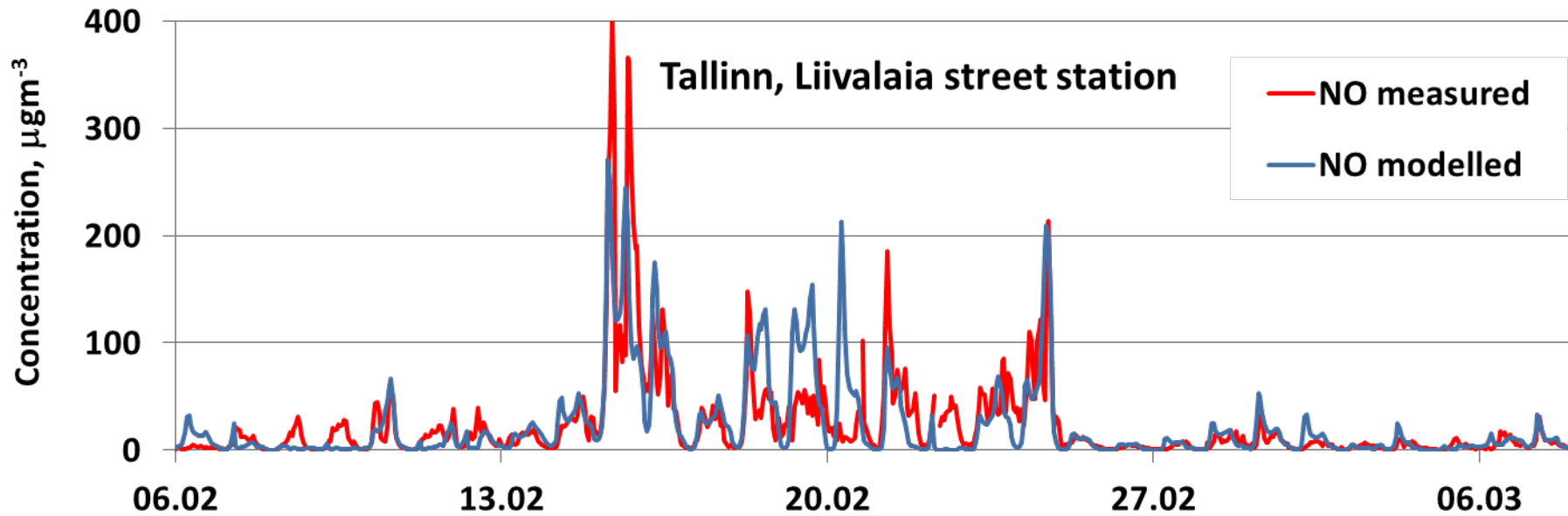
NO concentrations in EST domain, arbitrary time.

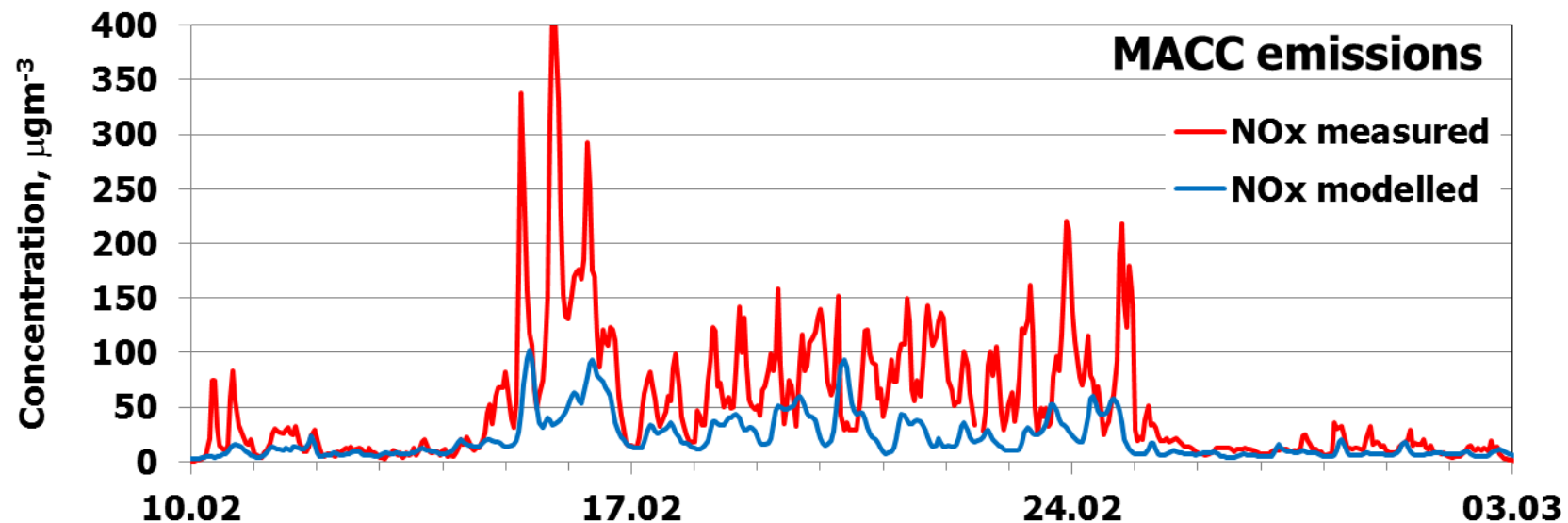
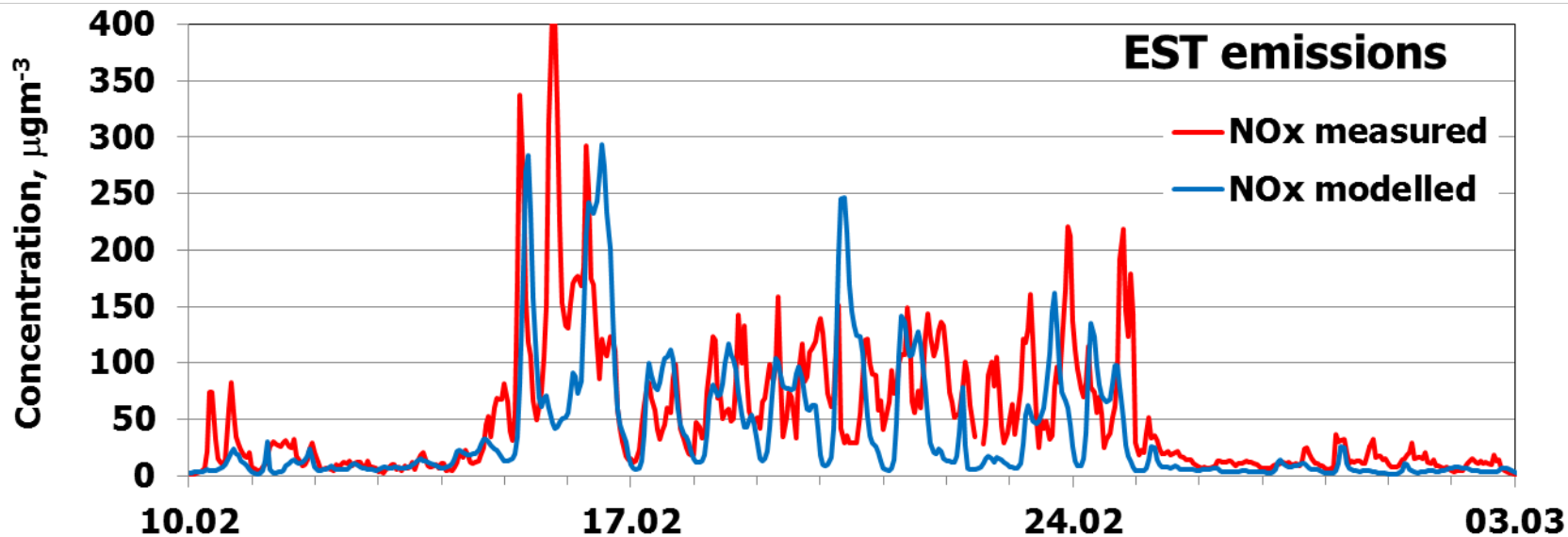
Monitoring stations:

1. Vilsandi – remote maritime
2. Lahemaa – rural
3. Saarejärve – rural
4. Tartu – urban
5. Tallinn-Õismäe – urban
6. Tallinn-Rahu – urban/ind.
7. Tallinn-Liivalaia – street
8. Kohtla-Järve – urban/ind.
9. Narva – urban/industrial



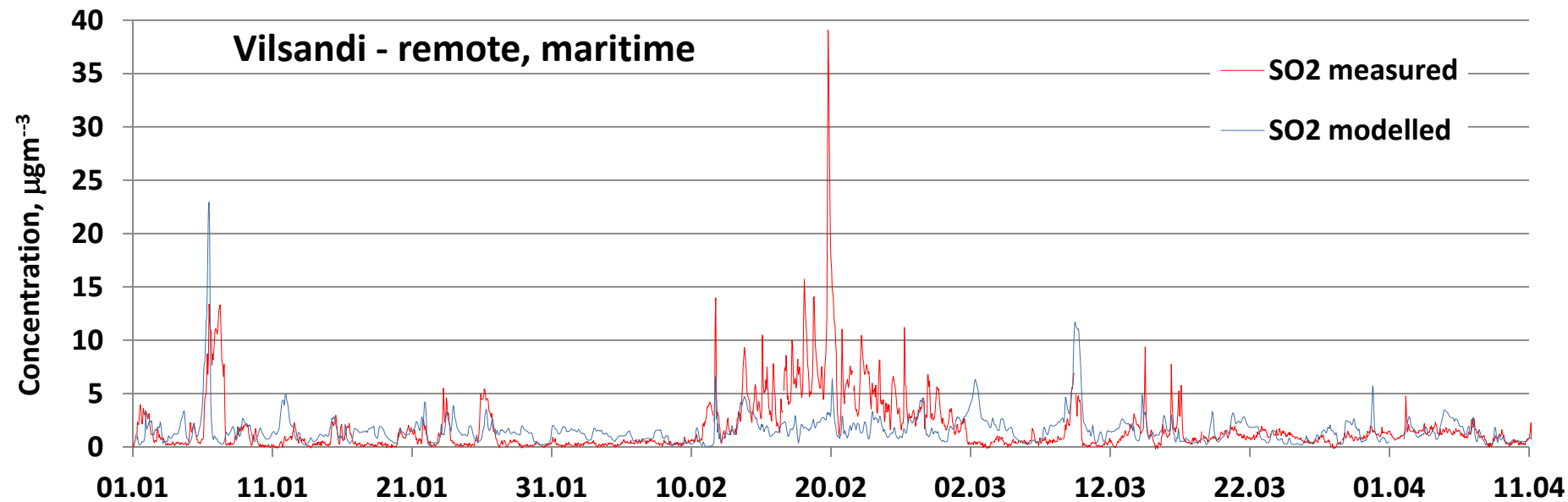
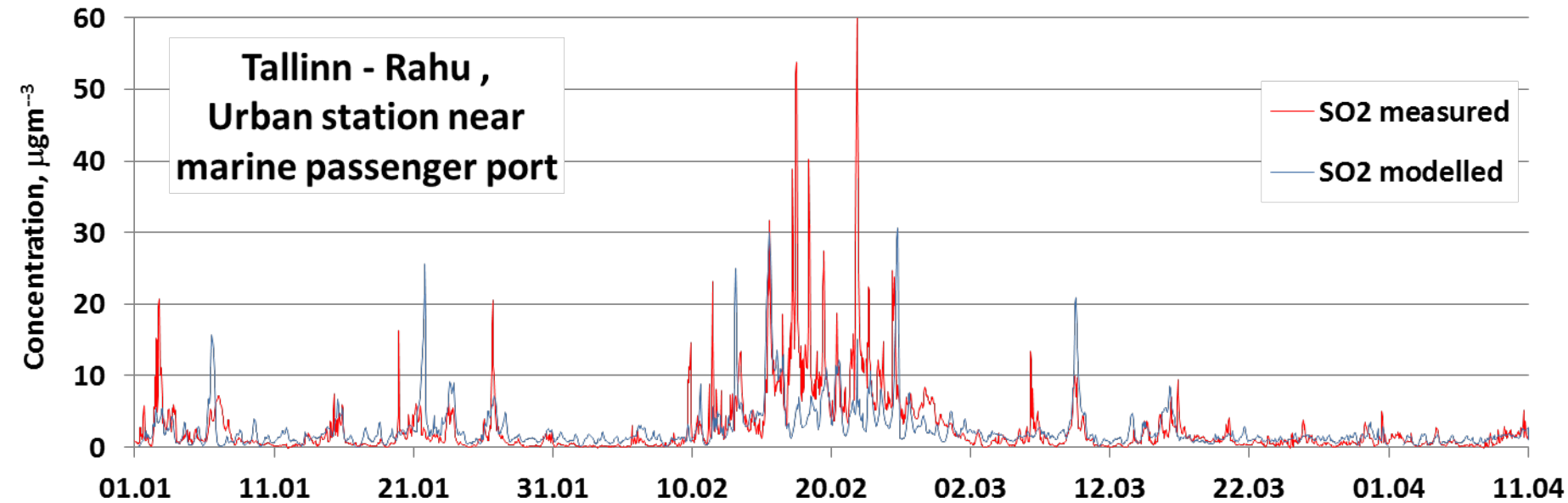


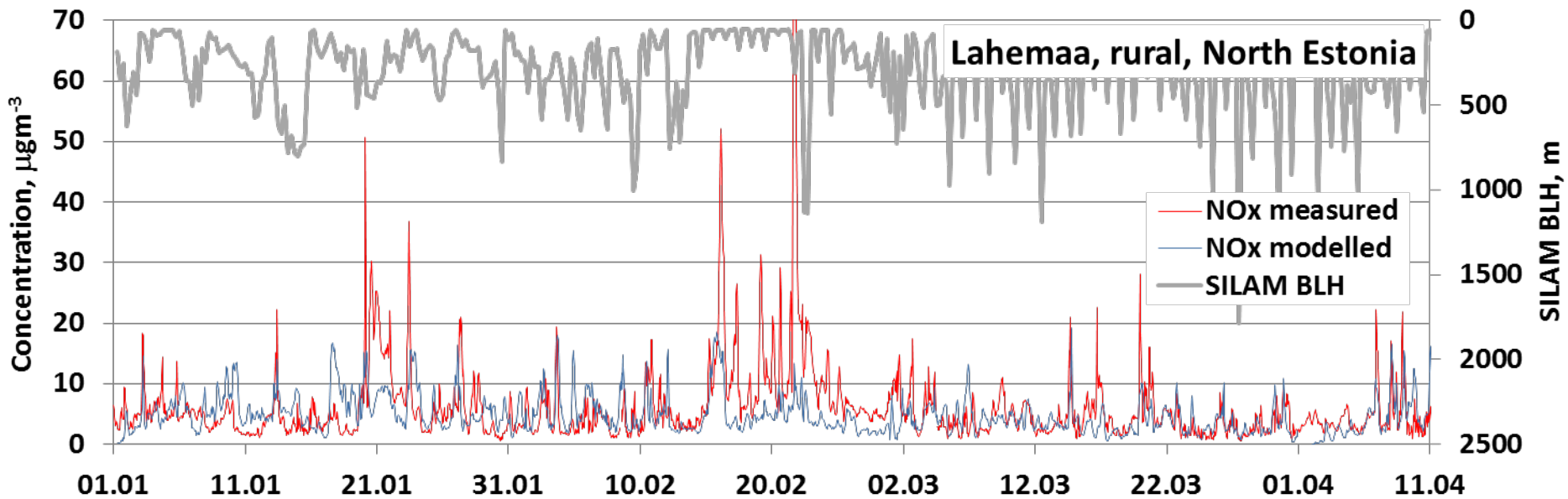
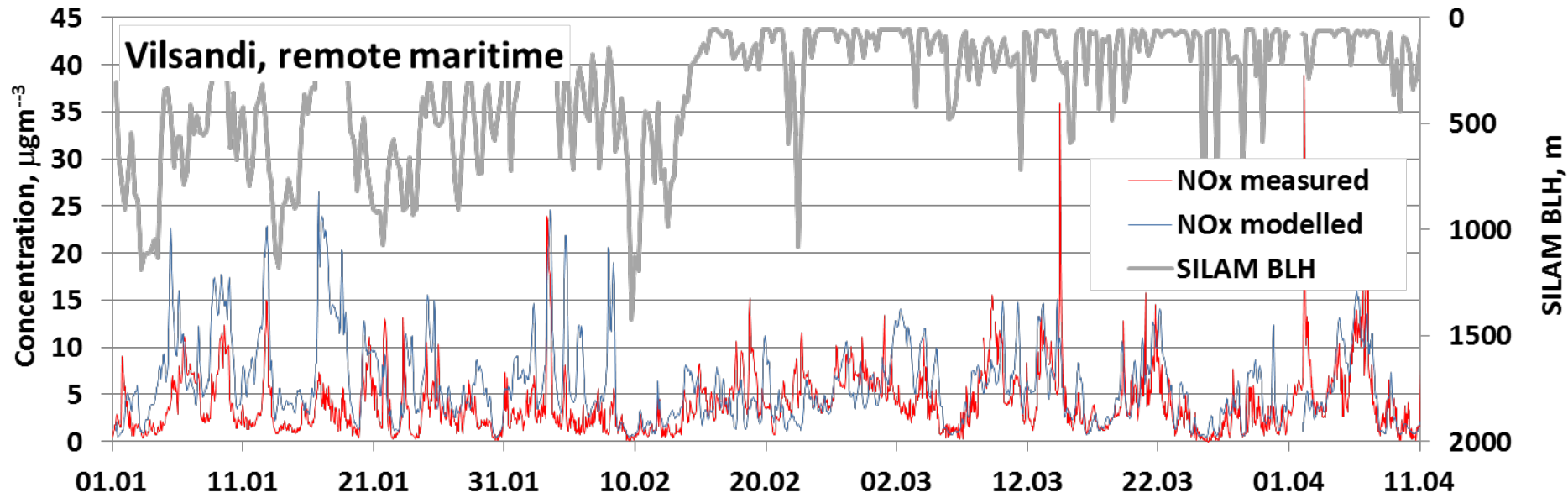




NOx (=NO+NO₂) concentrations.

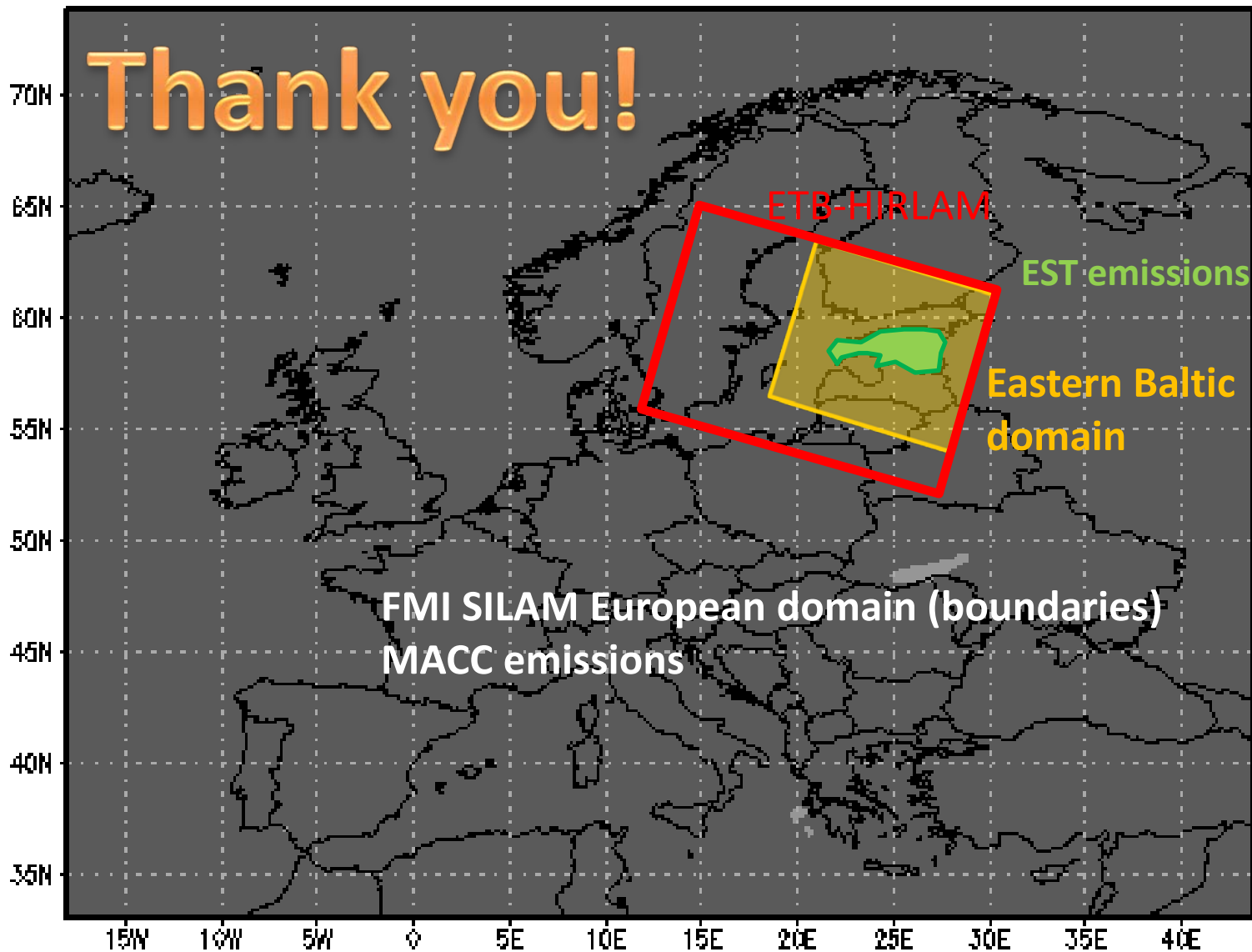
Tallinn-Õismäe urban background station.





Conclusions

- * SILAM performs well for urban and even street sites, when concentrations of NO_x, SO₂ and PM are enhanced due to Siberian anticyclon.
- * High-resolution database of emissions is essential to reproduce the urban concentrations.
- * Enhanced concentrations due to stable stratification in rural sites are not that well reproduced - tendency to underestimate. Some emission sources missing or too weak?



Operational configuration: <http://meteo.physic.ut.ee/silam> (since July 2012)
EST database of emissions.