



# O<sub>3</sub> AND O<sub>2</sub> MEASUREMENTS IN KIRUNA

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KRISTINEBERG 2024-06-05

# Agenda

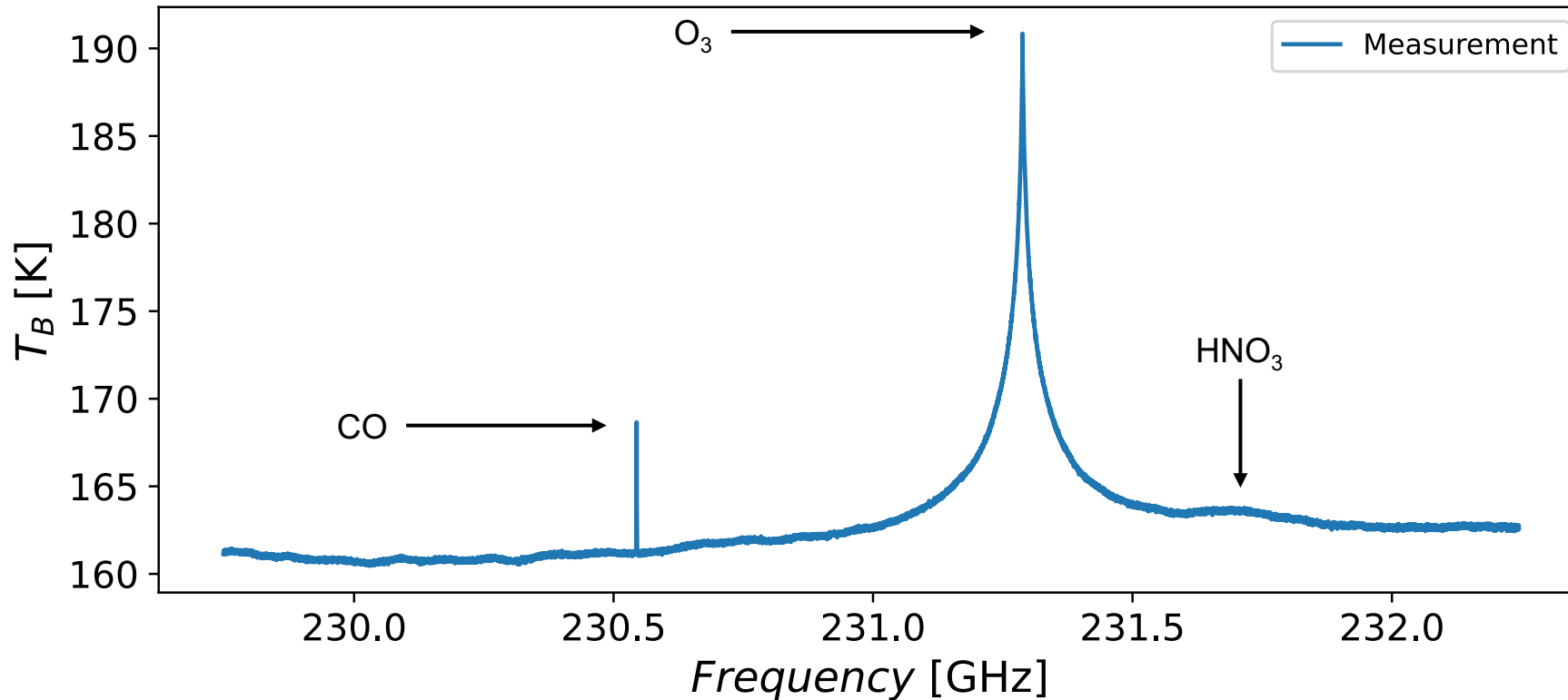


- Ozone measurements
- Ozone retrievals
- Molecular Oxygen measurements
- Upcoming work

# O<sub>3</sub> Measurements

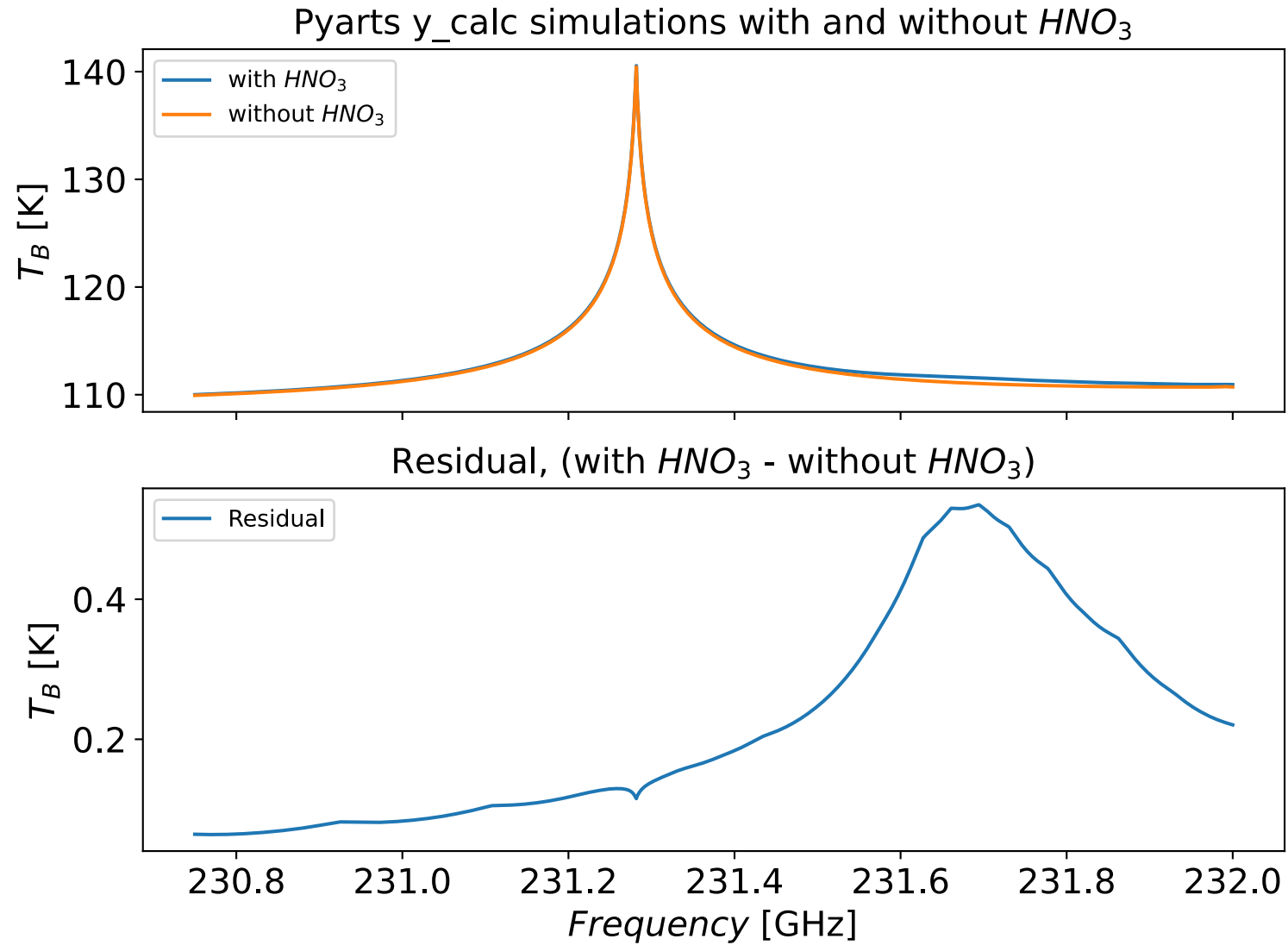


KIMRA RPGFFTS measurement of CO and O<sub>3</sub> lines on 1/11 - 2023



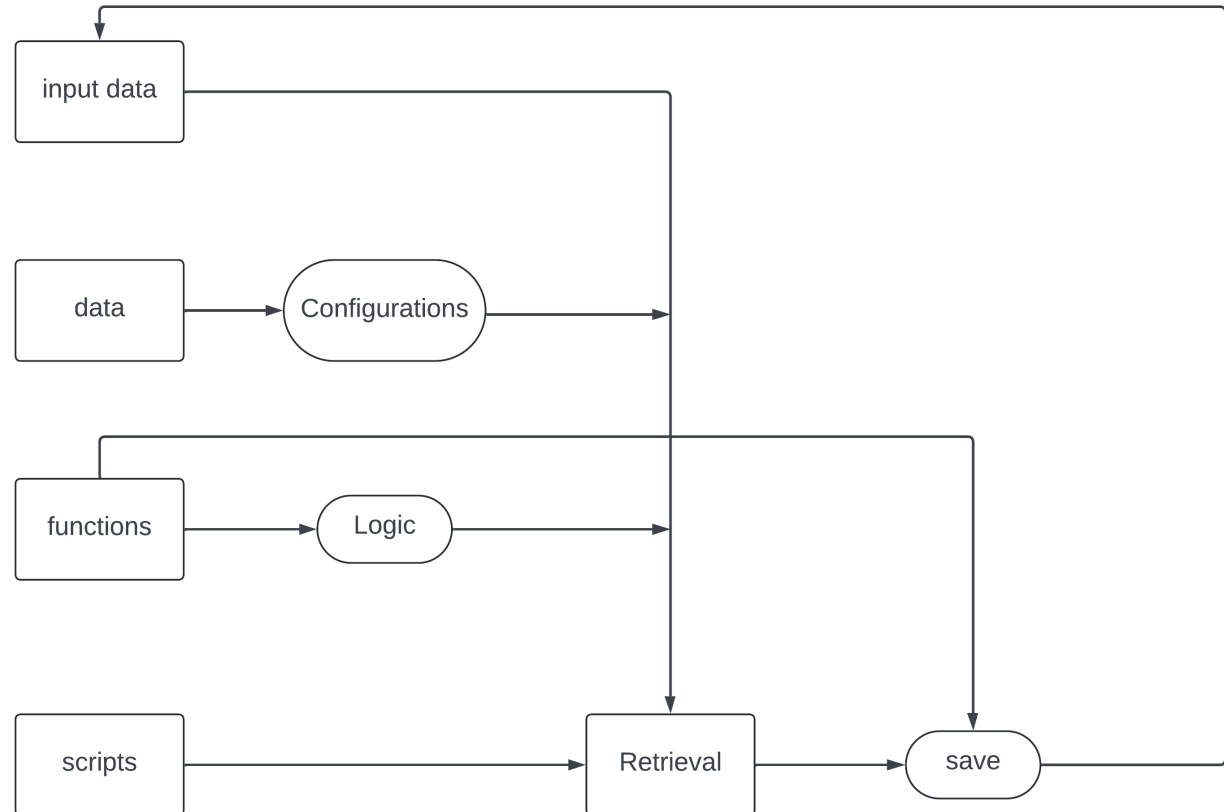
- O<sub>3</sub> line at 231.28 GHz
- CO line at 230.55 GHz
- HNO<sub>3</sub> band

# O<sub>3</sub> Measurements

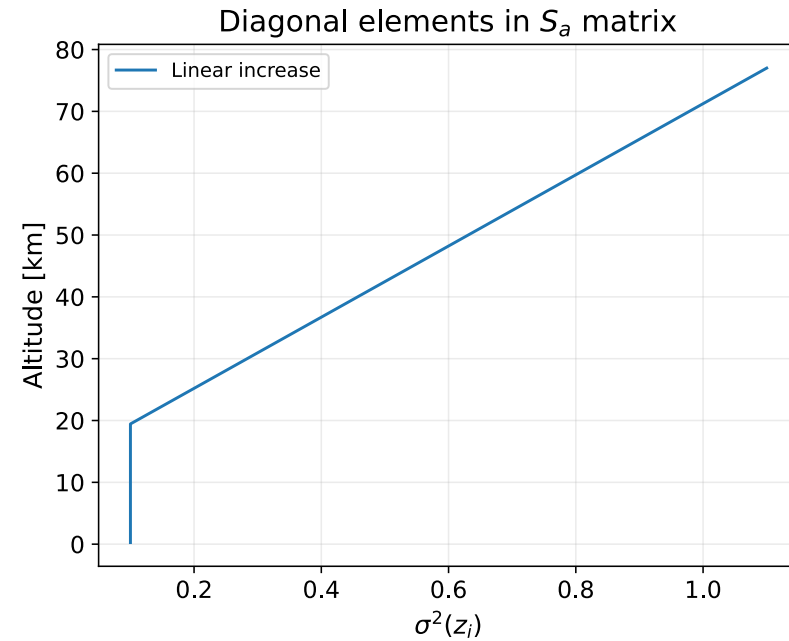
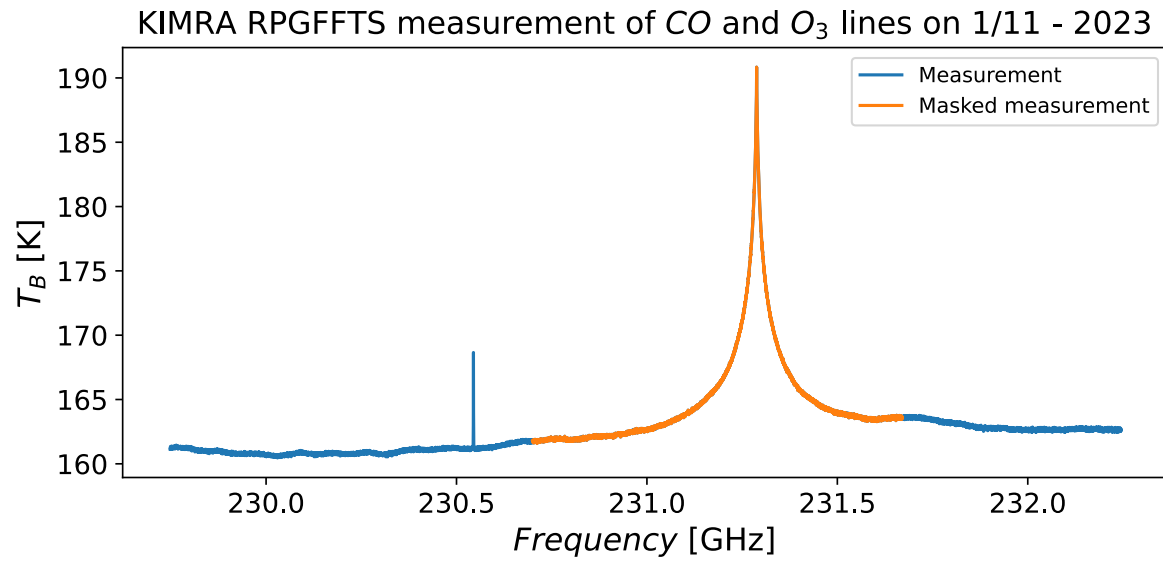


# O<sub>3</sub> Retrieval

- Pull input data from HDF5 file
- Load configurations
- Use logic to determine if retrieval has been done
- Save retrieval in input file under a different field

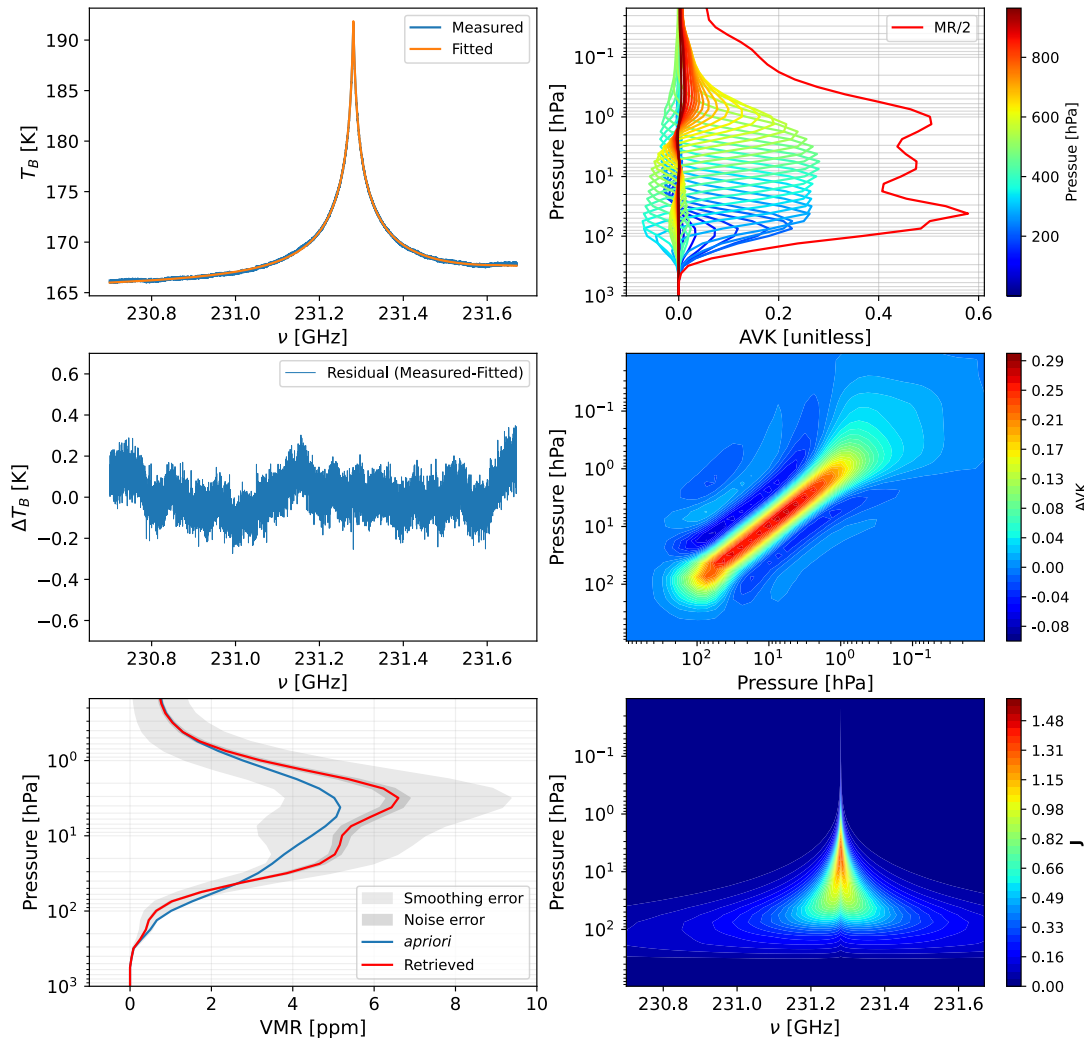


# O<sub>3</sub> Retrieval



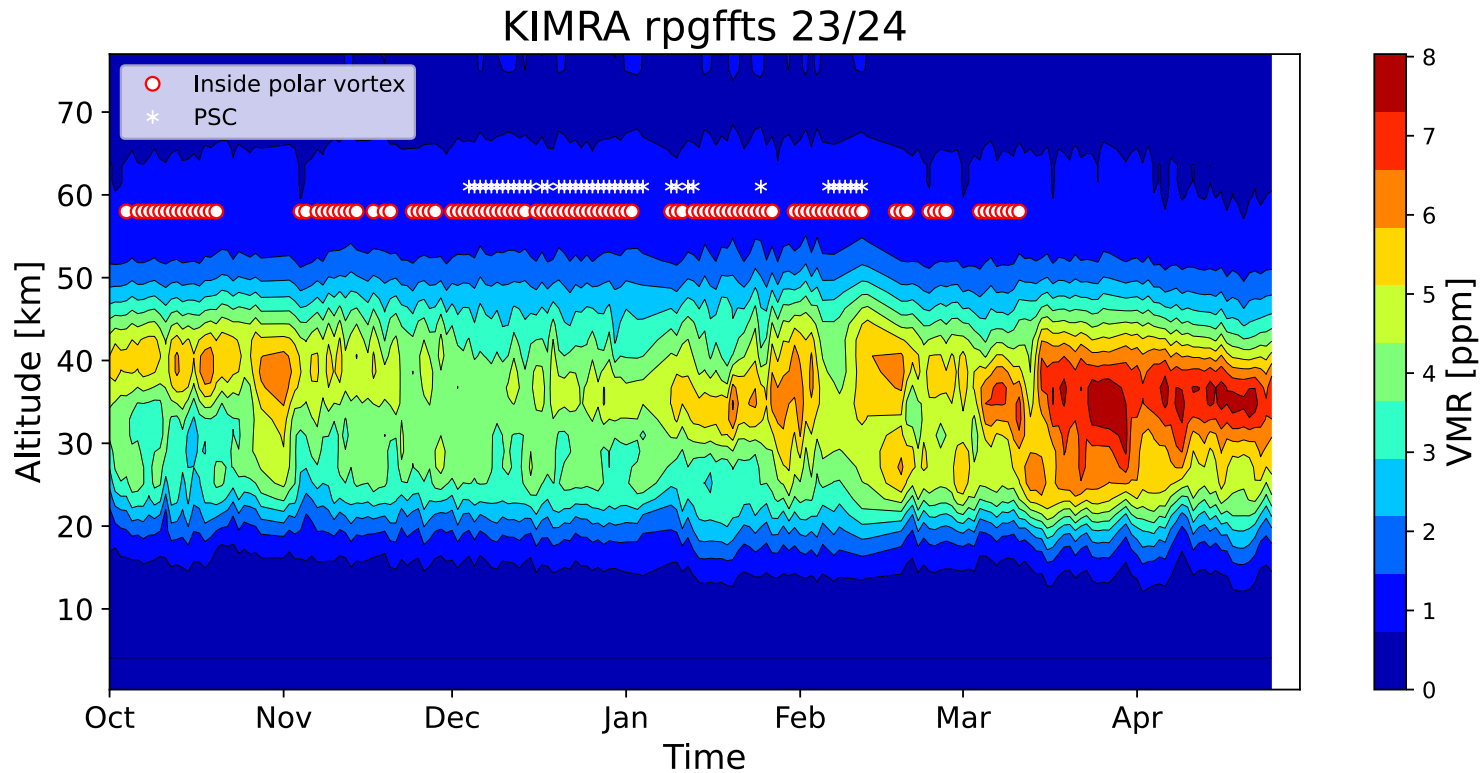
# O<sub>3</sub> Retrieval

KIMRA rpgffts 1/11 - 2023



- Good agreement between measured and fitted spectrum
- Small baseline effects and low noise
- Measurement response agree with previously known limitations of KIMRA

# O<sub>3</sub> Retrieval



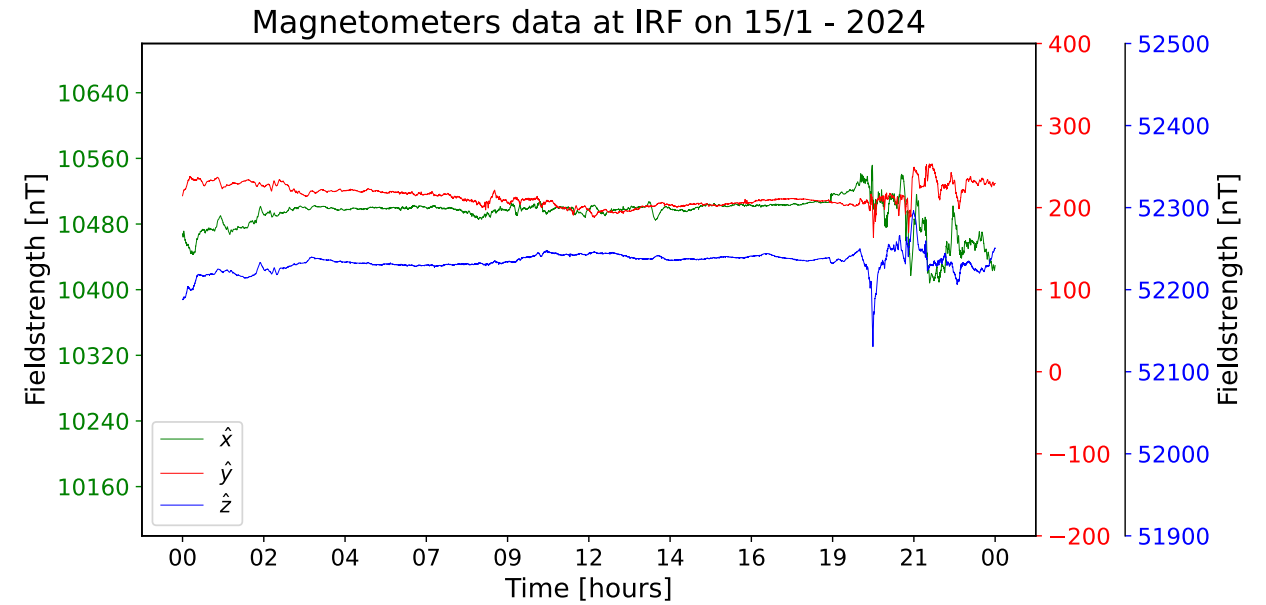
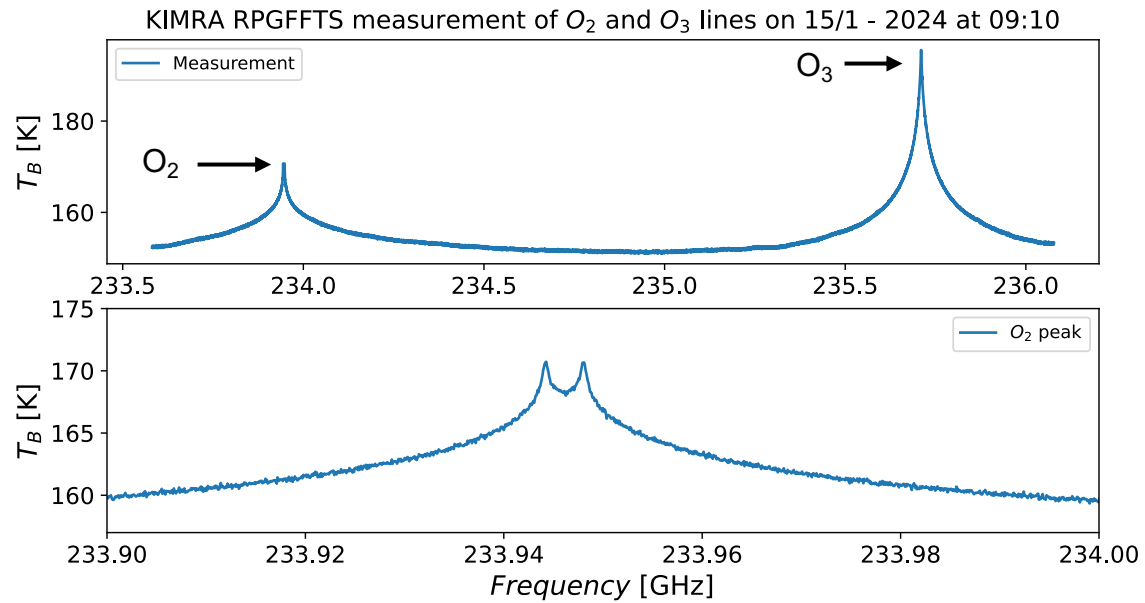
- VMR increases when Kiruna is outside of the polar vortex
- VMR decreases during the polar night and when Kiruna is inside the polar vortex
- VMR increases again when polar night ends and polar vortex weakens
- Further analysis has to be done



# O<sub>2</sub> Measurement



- O<sub>2</sub> line at 233.94614 GHz
- O<sub>3</sub> line at 235.70886 GHz



- Characterizing the optics in KIMRA
- Setup a retrieval routine for temperature profiles using molecular oxygen
- Perform ozone retrievals of all available KIMRA and MIRA2 data
- Do a deeper comparative analysis of various datasets for ozone retrieval
- Poster presentation at QOS in July 2024

Questions?