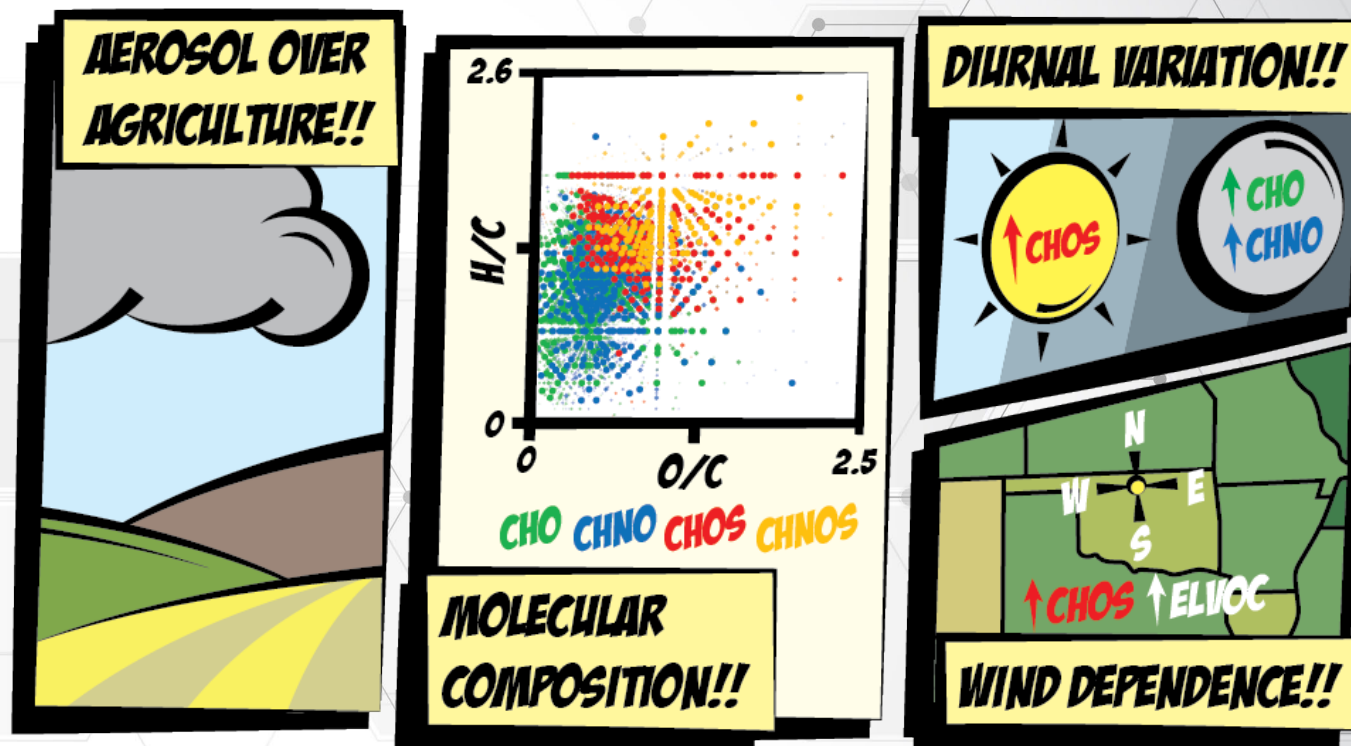


Molecular level understanding of vertically-resolved organic aerosol using direct mass spectrometry

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 Swarup China

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Molecular Characterization of Organosulfate-Dominated Aerosols over Agricultural Fields from the Southern Great Plains by High-Resolution Mass Spectrometry



Deployment of STAC at ARM- DOE Campaigns



OLI, Alaska
November 2020



SGP, Oklahoma
2021, 2022

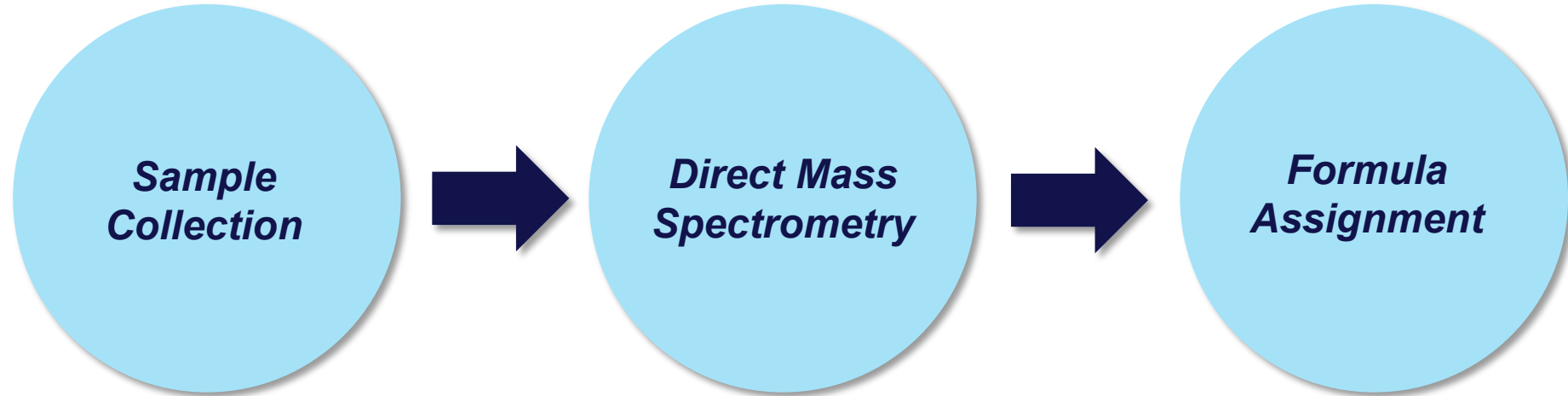
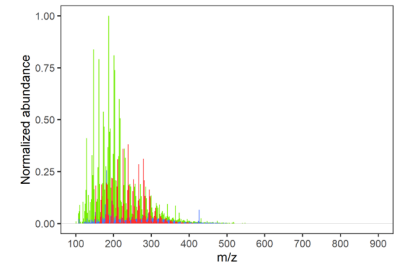


SAIL, Colorado
2021, 2022



TRACER, Texas
2022

Methodology



- Battery-powered impactor with TBS for **vertically resolved sample**
- **Ground sample**

- Nanospray desorption electrospray ionization (**nano-DESI**)
- High resolution mass spectrometry

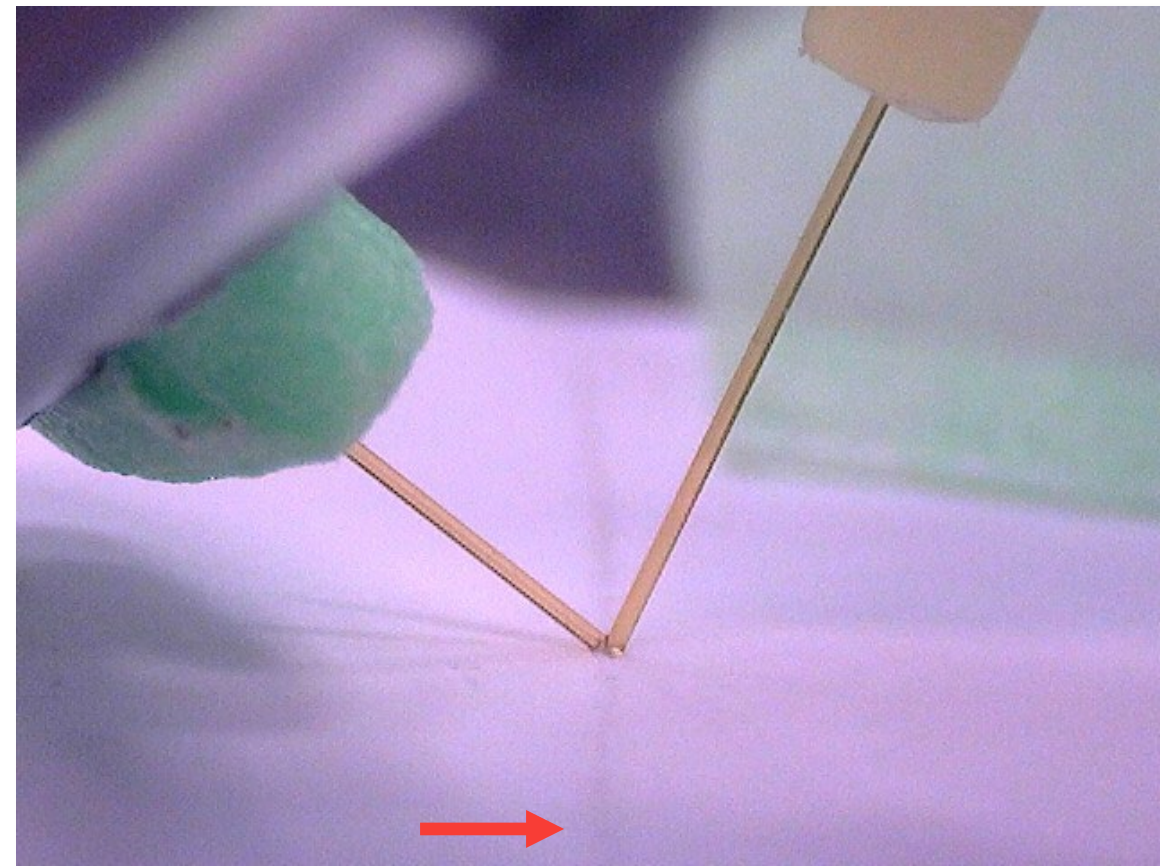
- **MFAssignR**
- **Molecular level interpretations** from assigned molecular formulae

TBS and
nano-DESI

April 17, 2022



Boundary layer at ~1000m



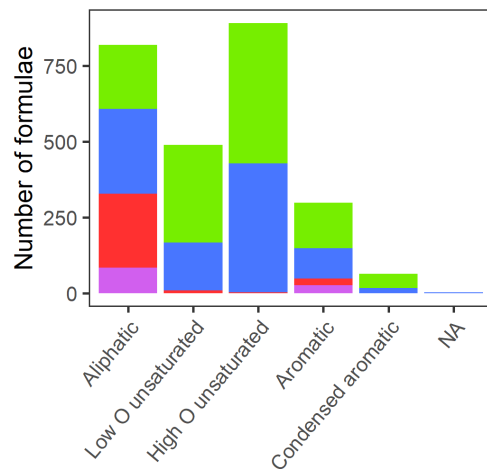
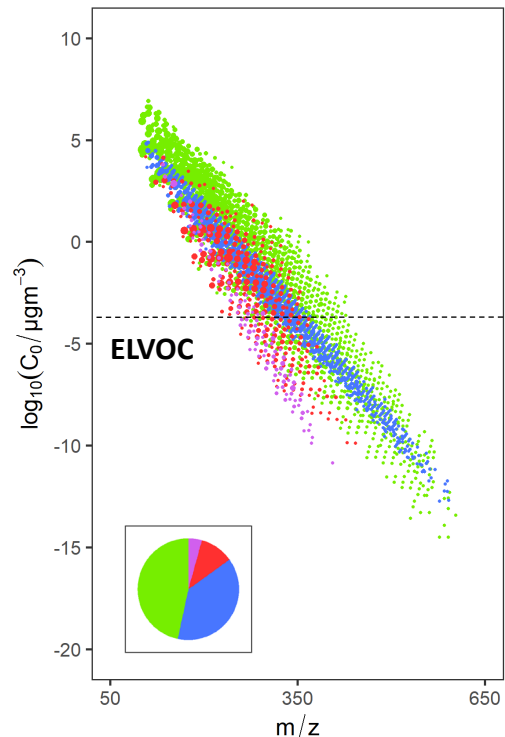
TBS sample (~3 hr total sampling time)

Vertically Resolved Molecular Composition of Organic Aerosols at the SGP Site

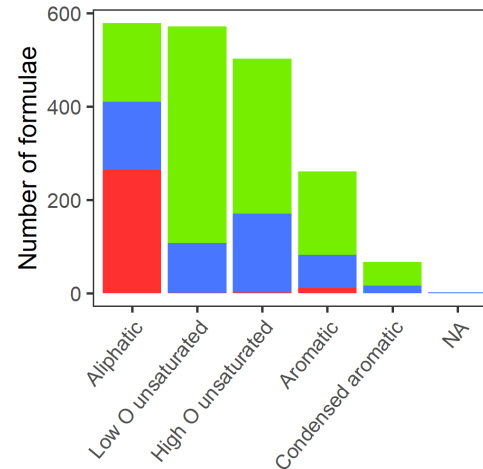
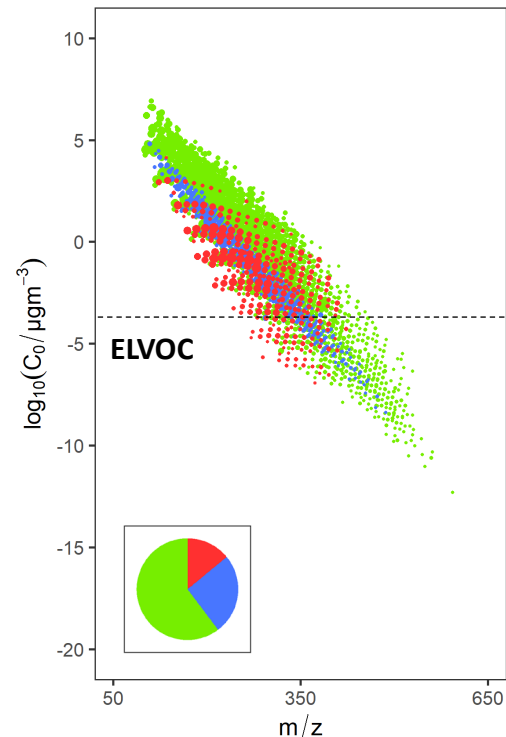
April 17, 2022

Group	n_abundance
CHO	● 0.25
CHNO	● 0.50
CHOS	● 0.75
CHNOS	● 1.00

TBS (0 – 700m)



Ground Level



- **CHNOS uniquely** in TBS sample
- Increase in **low volatility species**, particularly CHNO, in TBS sample
- Greater population of **CHOS in ground sample**

Questions?



Nurun Nahar Lata, Susan Mathai, Swarup China, Gregory Vandergrift, Jay Cheng

