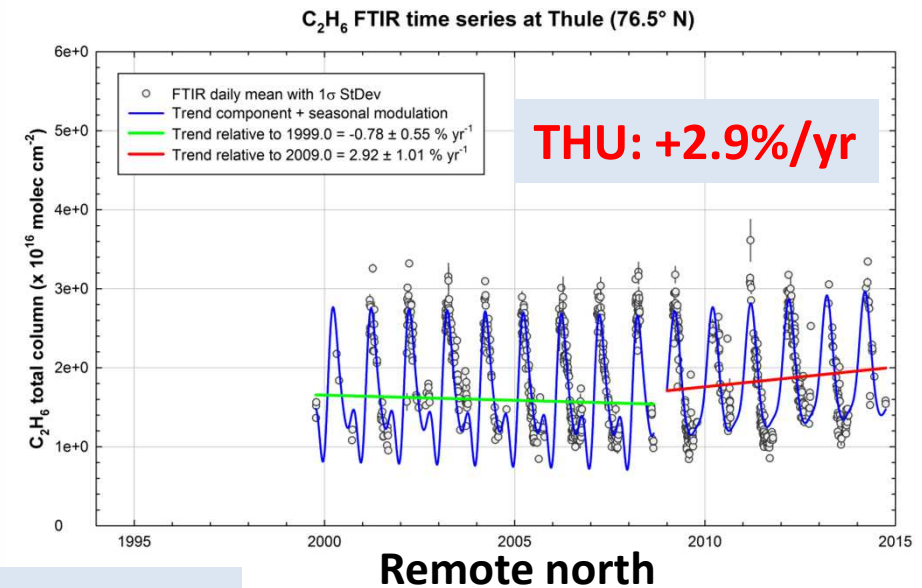
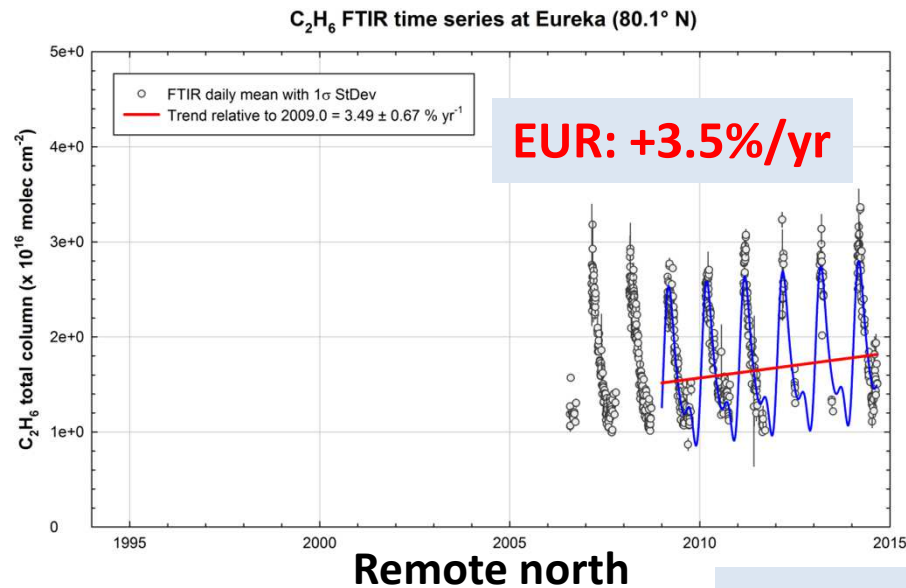
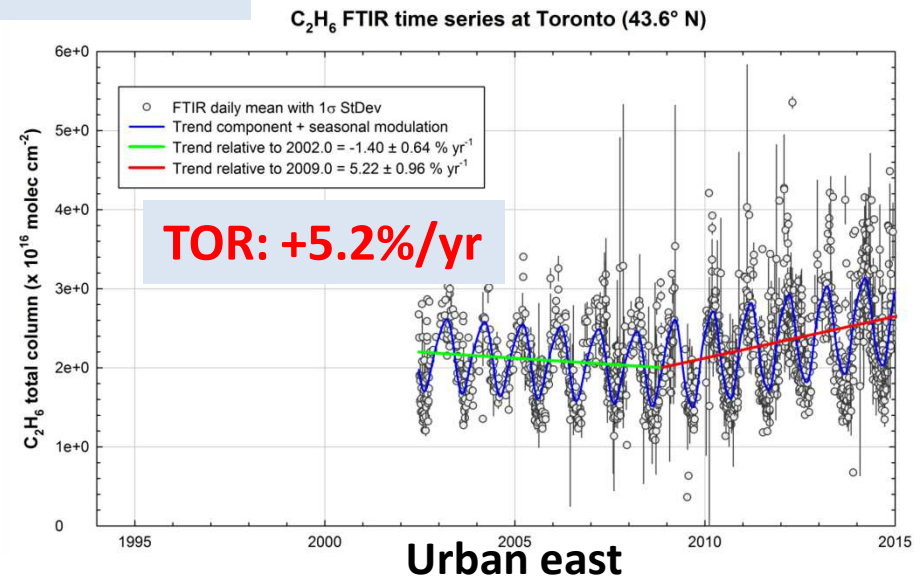
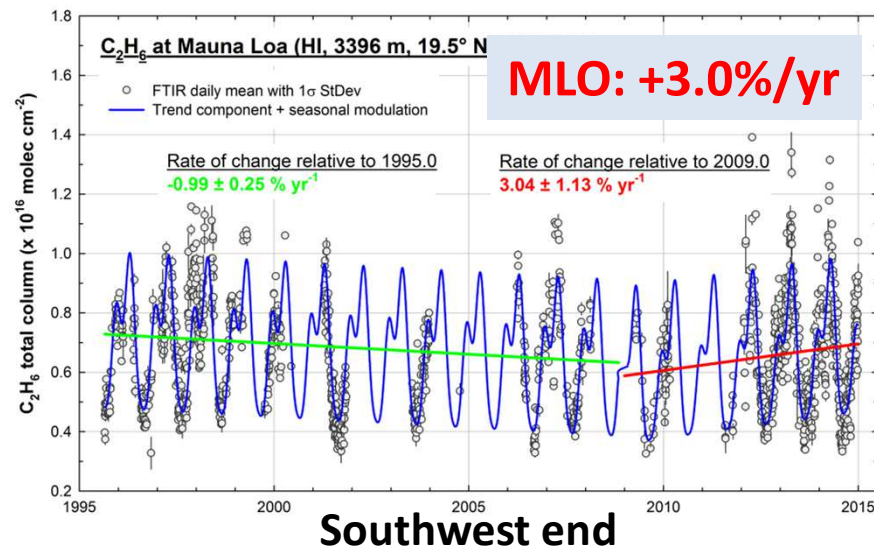


Ethane recent rise discussion

- Facts & wrap up (previous talks, slides from Sarah Monks and Chris Wilson)
- Motivations
- Resources
- Requirements
- Go for a IRWG paper?



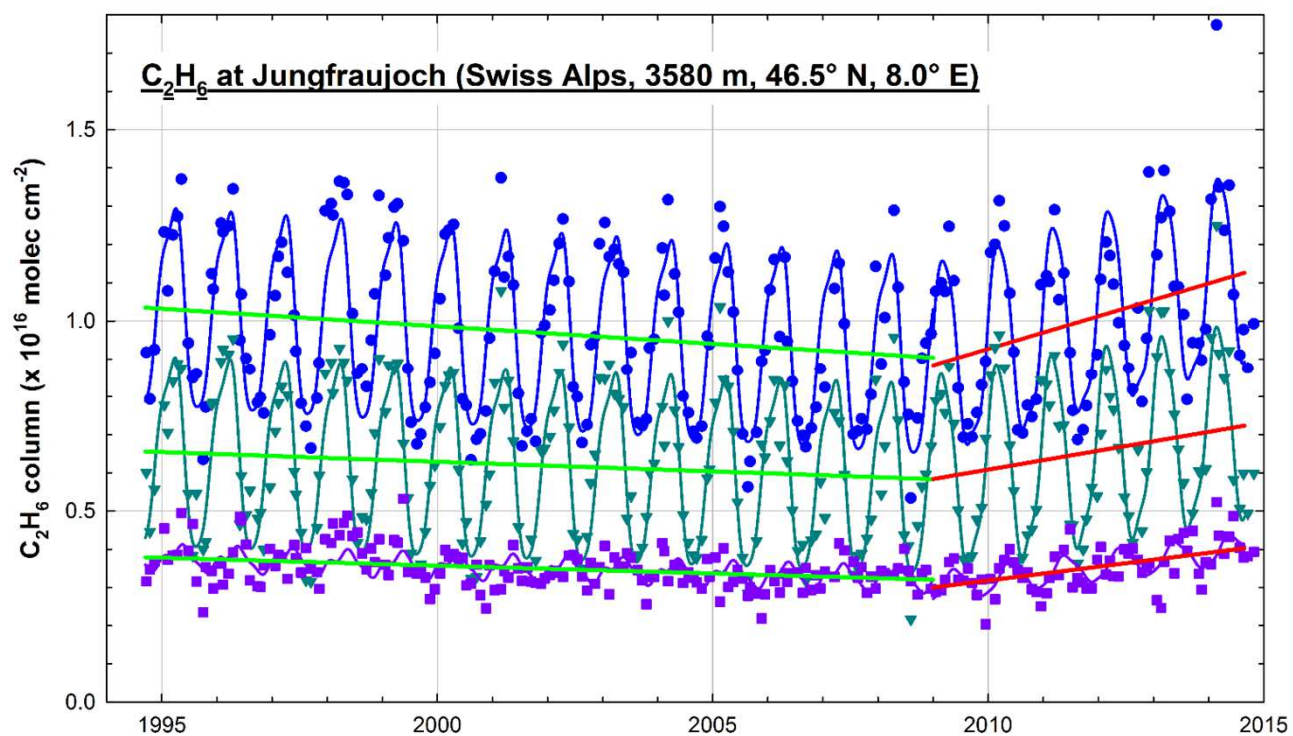
NDACC observations



SHOWN: North American sites – Consistent trends at ZUG & JUN – No increase at LAU

FACTS

JUNGFRAUJOCH: partial column trends

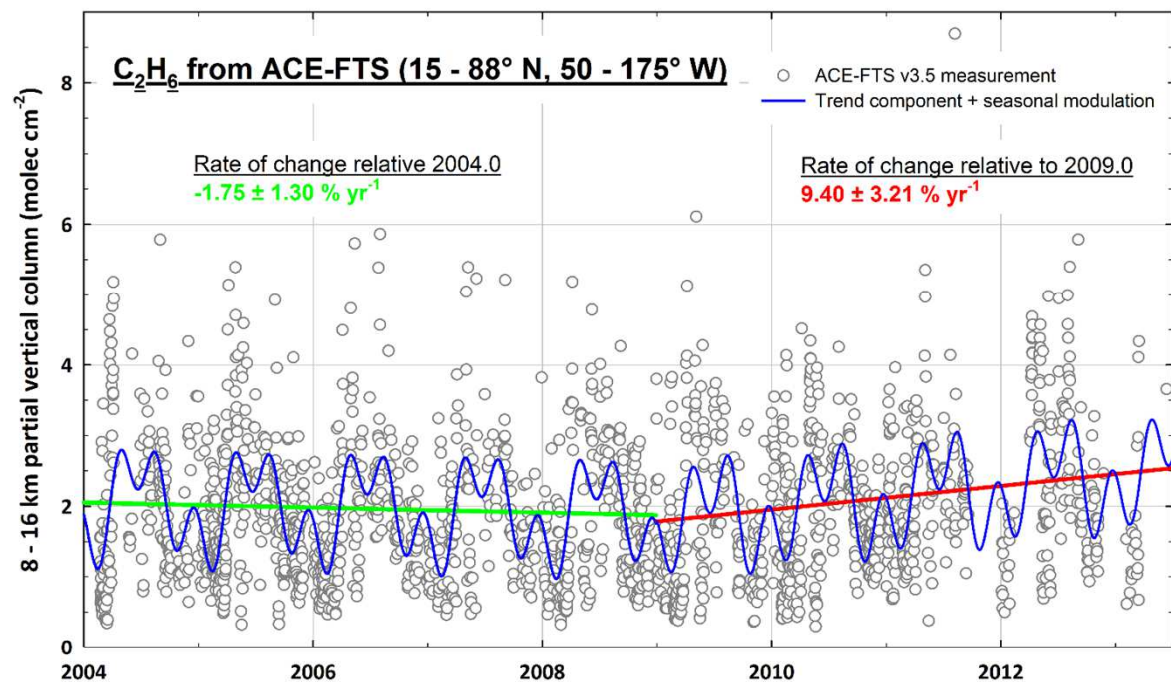


Monthly means are shown

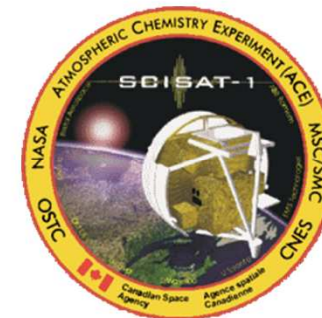
Rates of change wrt 2009

- Total column
4.85 ± 0.85 % yr⁻¹
- Lower troposphere
(3.6-8 km)
4.23 ± 1.06 % yr⁻¹
- UTLS (8-21 km)
6.05 ± 1.09 % yr⁻¹

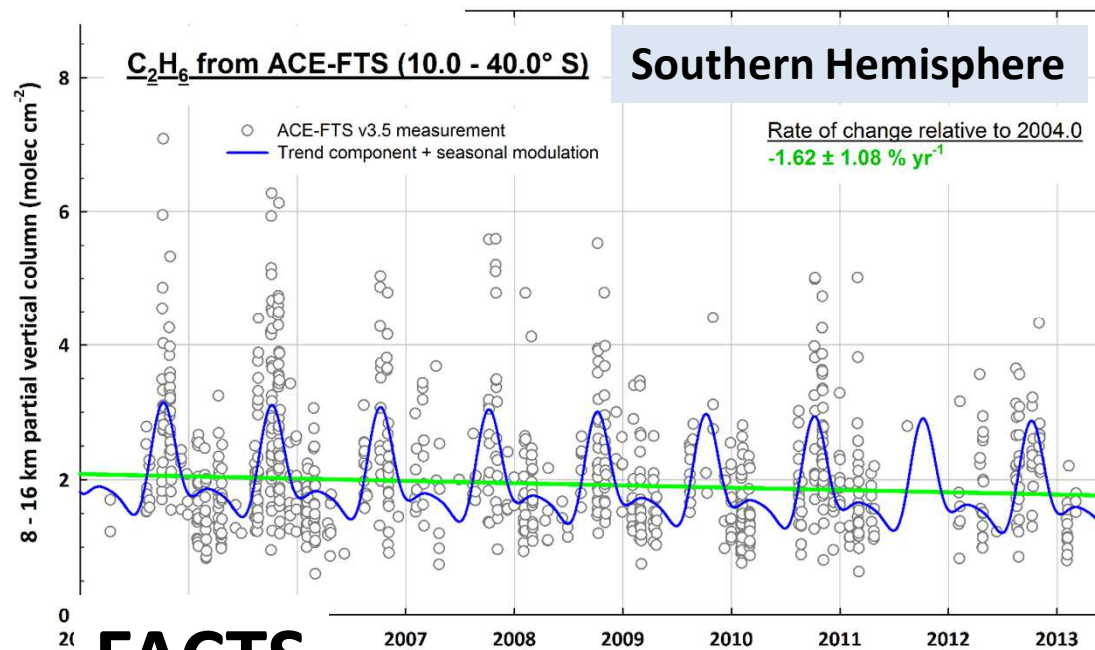
FACTS



North America



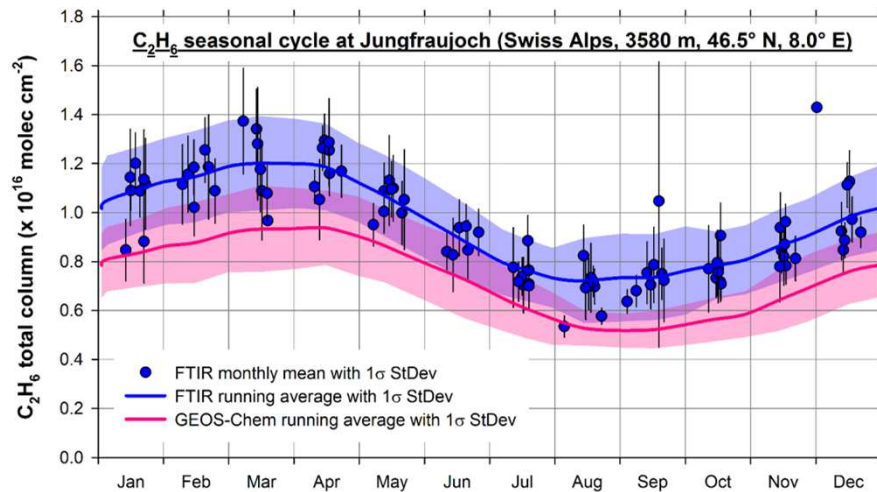
**SATELLITE measurements:
ACE-FTS Solar Occ. Obs.**



Southern Hemisphere

FACTS

GEOS-Chem model simulations

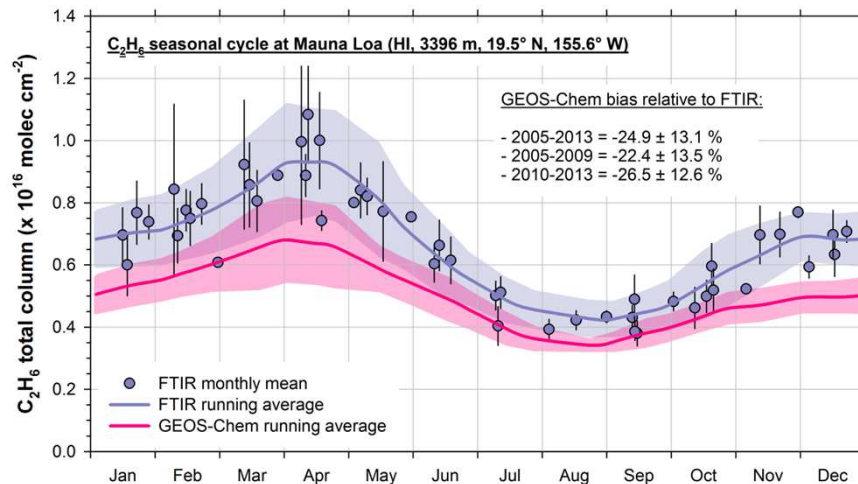


JUN

- Low bias (~25% > syst. error on FTIR columns)

- Do not capture the increase

- Good representation of the seasonal modulation



MLO

FACTS

Motivations

- Characterize the situation on the global scale and the spread (horiz. & vertic. mixing) of ethane
- Determine/confirm the causes for the recent rise
- Link with methane (coincident) emissions
- Impact on air quality and tropospheric ozone production (precursor)
- Evaluate the emissions needed to capture the current levels and trends (magnitude, geographical and temporal distributions) \Leftrightarrow CH₄

MOTIVATIONS

Available resources

- GEOS-Chem CTM model (run@CSU: E.V. Fischer & Z. Tzompa & @ULg)
- CHASER simulations (K. Sudo, Nagoya U.): a priori shift
- NCAR/NOAA/Leeds simulations (sensitivity studies & inverse modeling: L. Emmons, S. Monks, Ch. Wilson et al.)
- Xiao et al (2008) inventory++
- GOSAT CH₄ emission maps for the US (A. Turner, Harvard; implementation through HEMCO)
- ACE-FTS occultation measurements (v3.5, 2004++)
- Many NDACC or NDACC-like FTIR time series (**YOU!**)

RESOURCES

Requirements

- Consistent and regular FTIR data from –at least – 2009 onwards
- Retrieval approach as per Franco et al:
 - i.e. **NDACC-IRWG** (2 or 3 windows, HITRAN08, Harrison spectroscopy (GCT pseudolines)...)
 - with two specifics: WACCM v6 scaled, CHASER covariance (syst. biases to be avoided)
- Full data sets provided in GEOMS compliant hdf (benefit: consistent update of the NDACC database: availability & visibility)

REQUIREMENTS

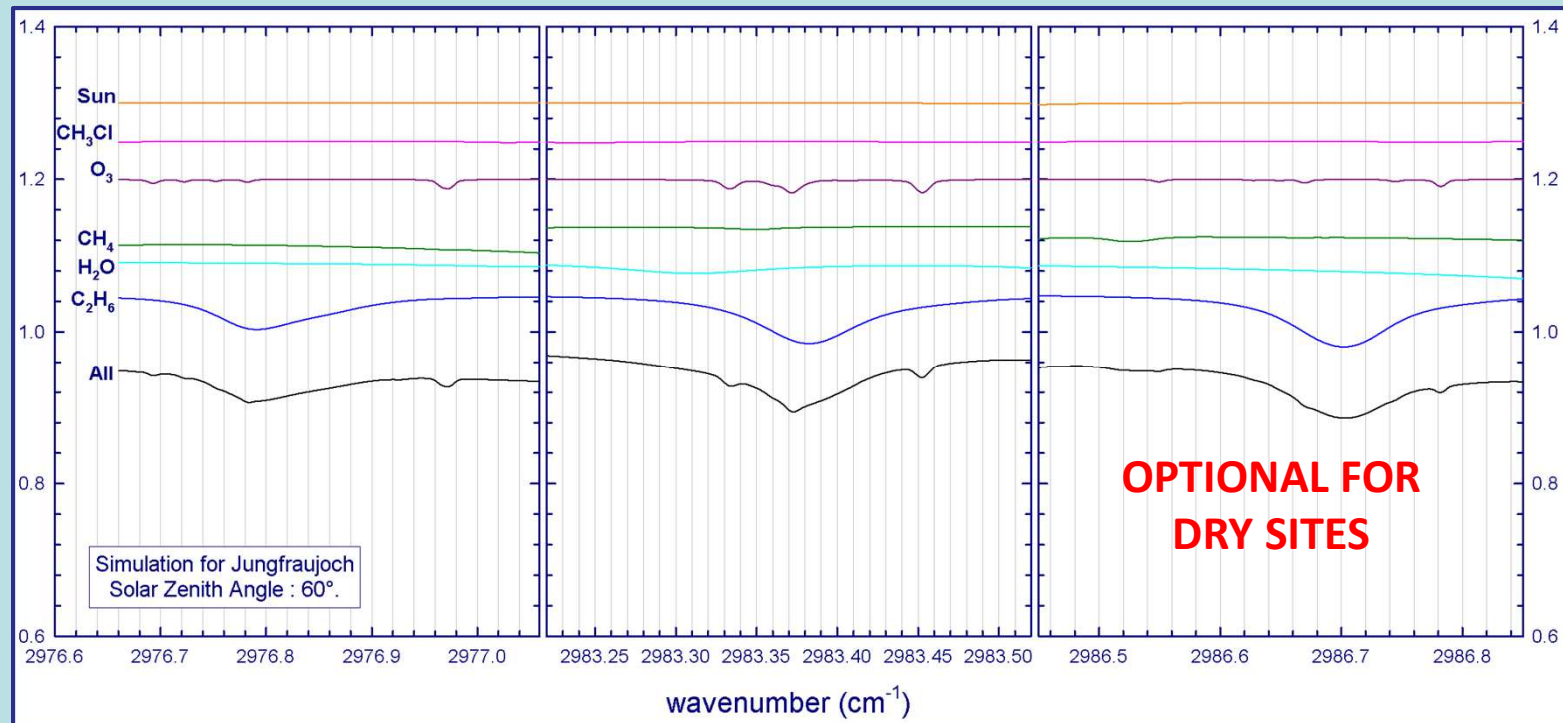
Bande d'élongation C-H

PQ^3

PQ^1

RQ^0

Sites secs @ hautes latitudes



Fortes interférences de H₂O

REQUIREMENTS

IRWG paper on ethane rise?

- The subject is a hot topic, with many important implications (AirQ, shale gas exploitation in the US and elsewhere, methane emissions and budget...)
- Contacts established and tools available
- This effort should involve as many FTIR sites as possible and ACE-FTS (global perspective and model constraints)
- It is likely that a paper focusing on in situ/flask surface measurements will go in parallel
- This is the right time to update the C₂H₆ FTIR time series
- Would you agree to join this effort?
- Any suggestions?