



SAUNA

The Sodankyla validation campaign

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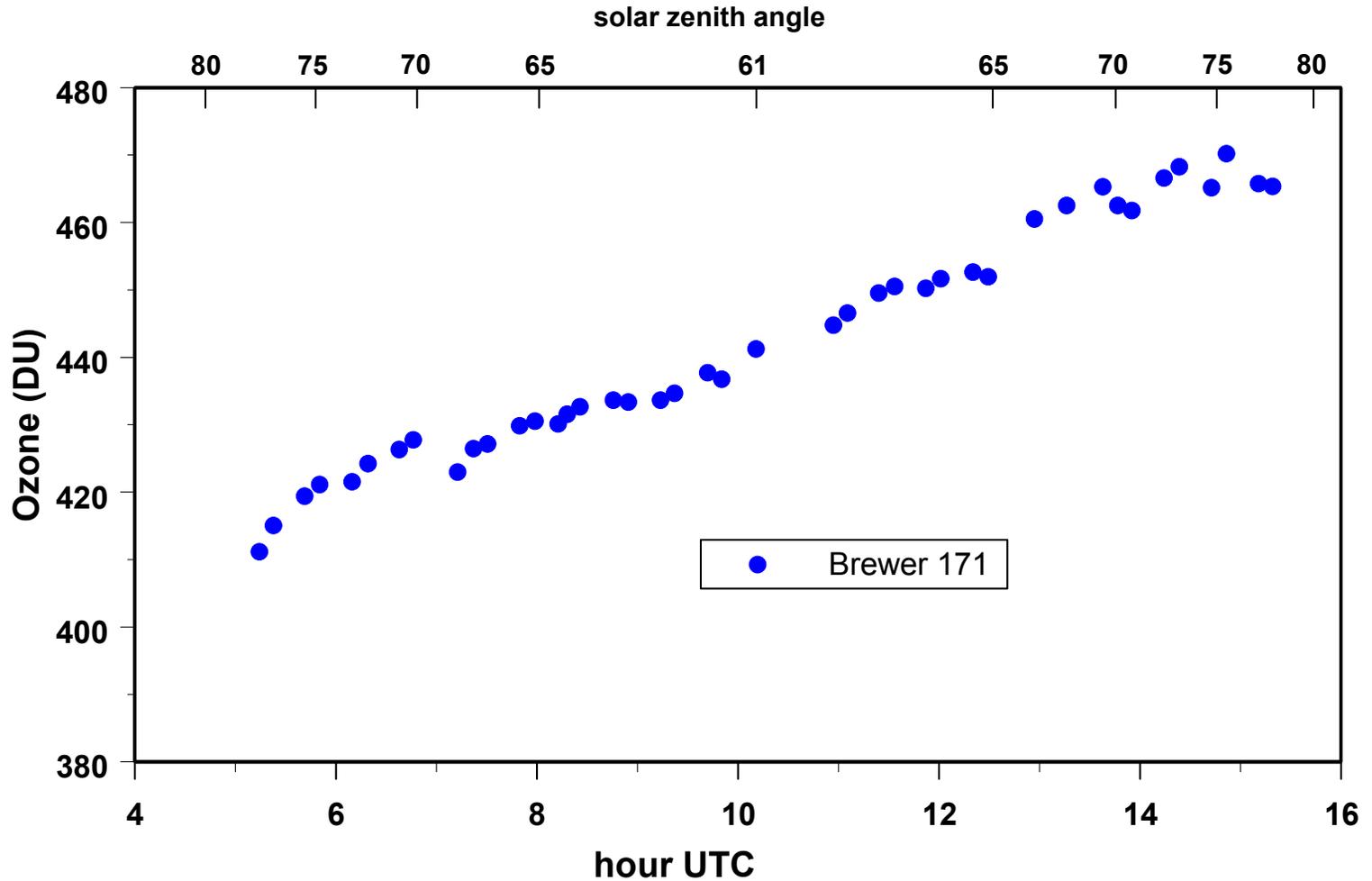
Total column ozone issues

Currently:

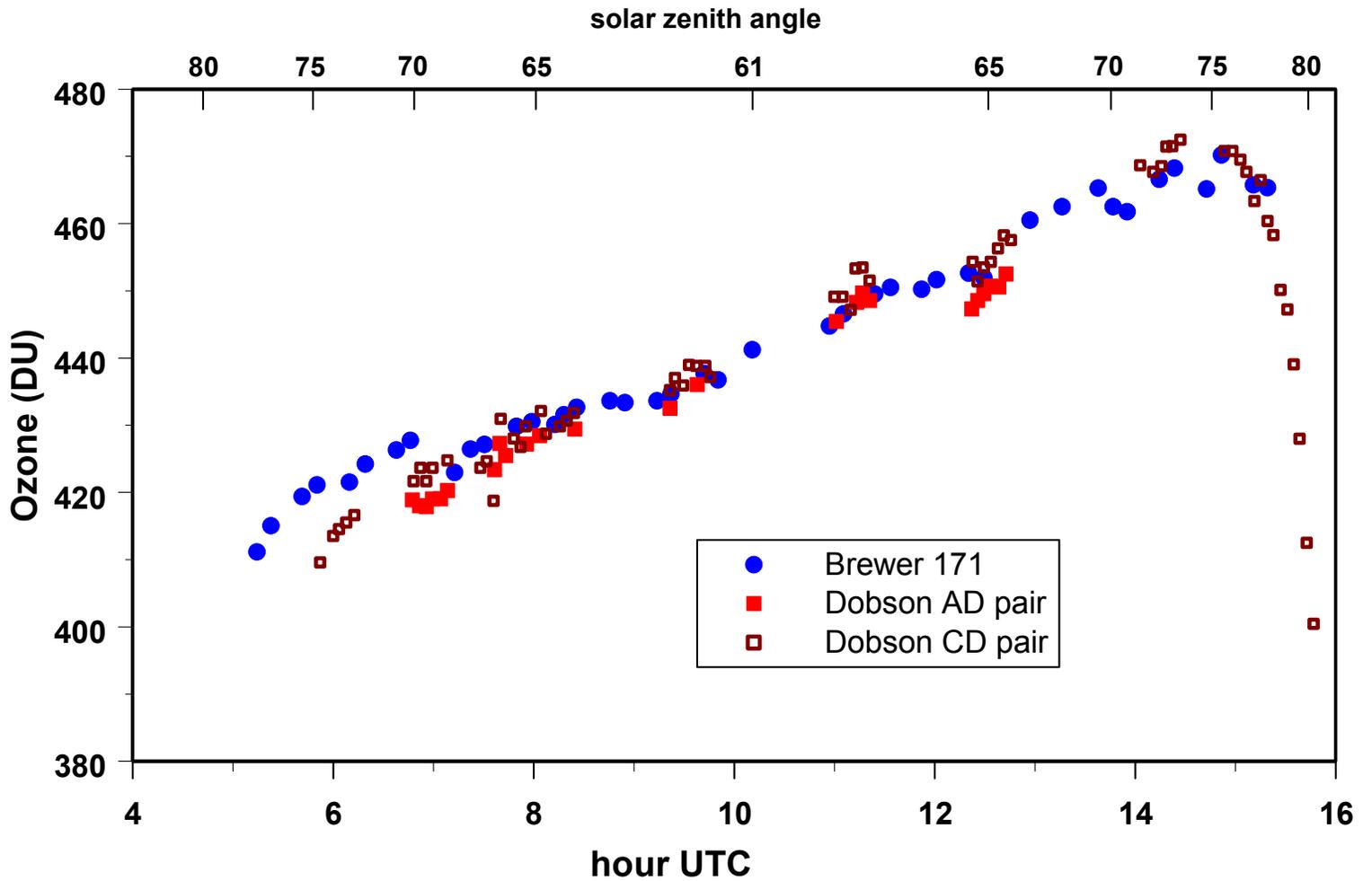
- Satellite measurements agree within 2-3% globally
 - Differences at low sun, high column amounts, high reflectivities, etc.
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- Need to verify the accuracy of ground-based measurements for satellite validation purposes

Total column ozone issues (2)

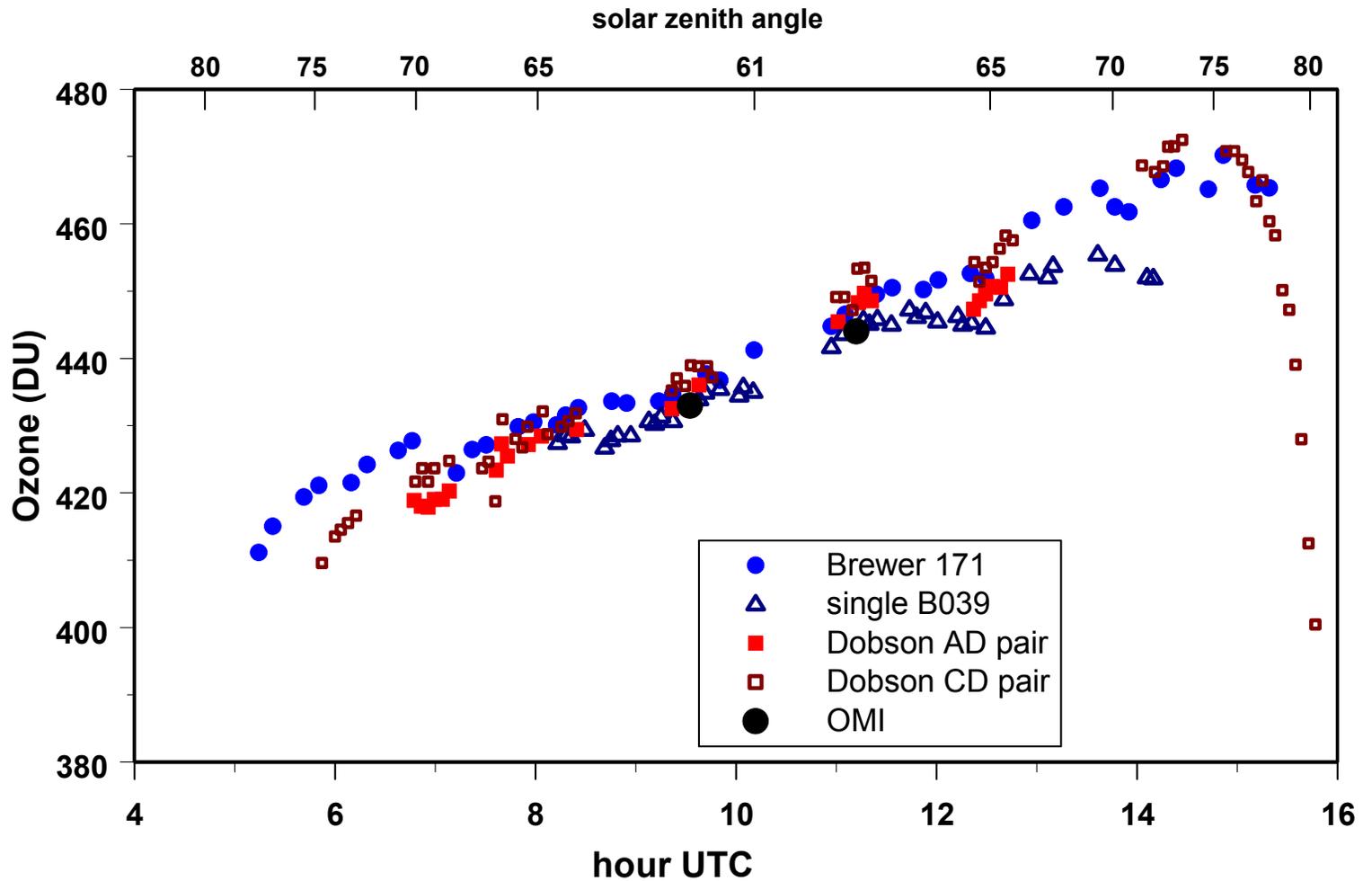
- In an attempt to better understand the column issues, NASA, ESA and FMI conducted two field campaigns
 - Focus during high column, low sun periods in Northern Finland
 - SAUNA: March-April 2006
 - SAUNA 2: February-April 2007
 - Combined network instruments: Dobsons, Brewers, DOAS, sondes and LIDAR
 - Included World and European standard instruments
 - Involved more than 30 Scientists from 12 institutes in 10 countries



Ozone measurements made by double Brewer throughout the day on April 5, 2006. The double Brewer is *assumed* to be accurate for SZA < 80°



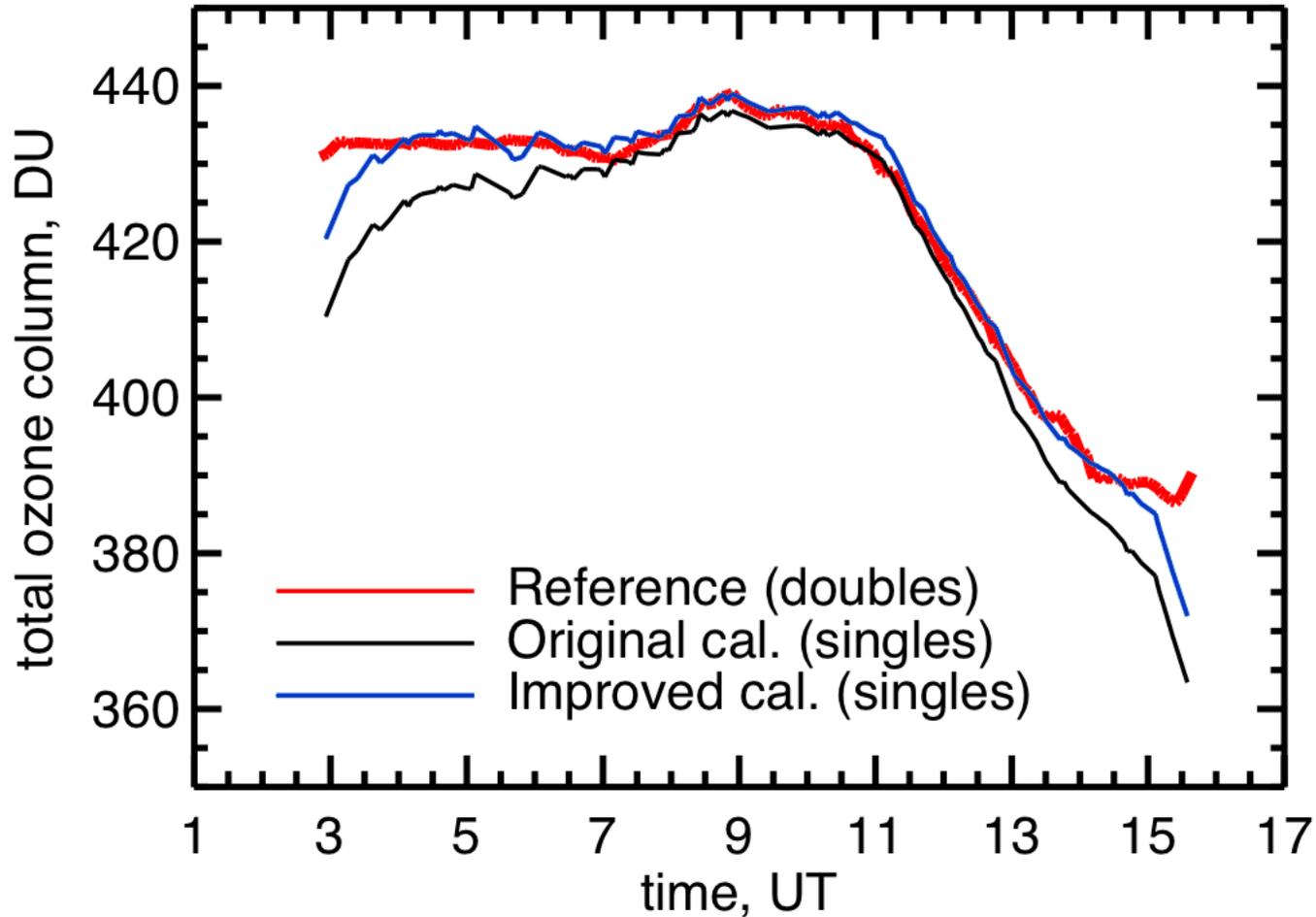
Dobson measurements made with AD pair to $\sim 65^\circ$ SZA, the switch to CD pair.



OMI agreed well with ground based measurements during two overpasses. Single Brewer shows some error at high SZA (high slant column ozone).

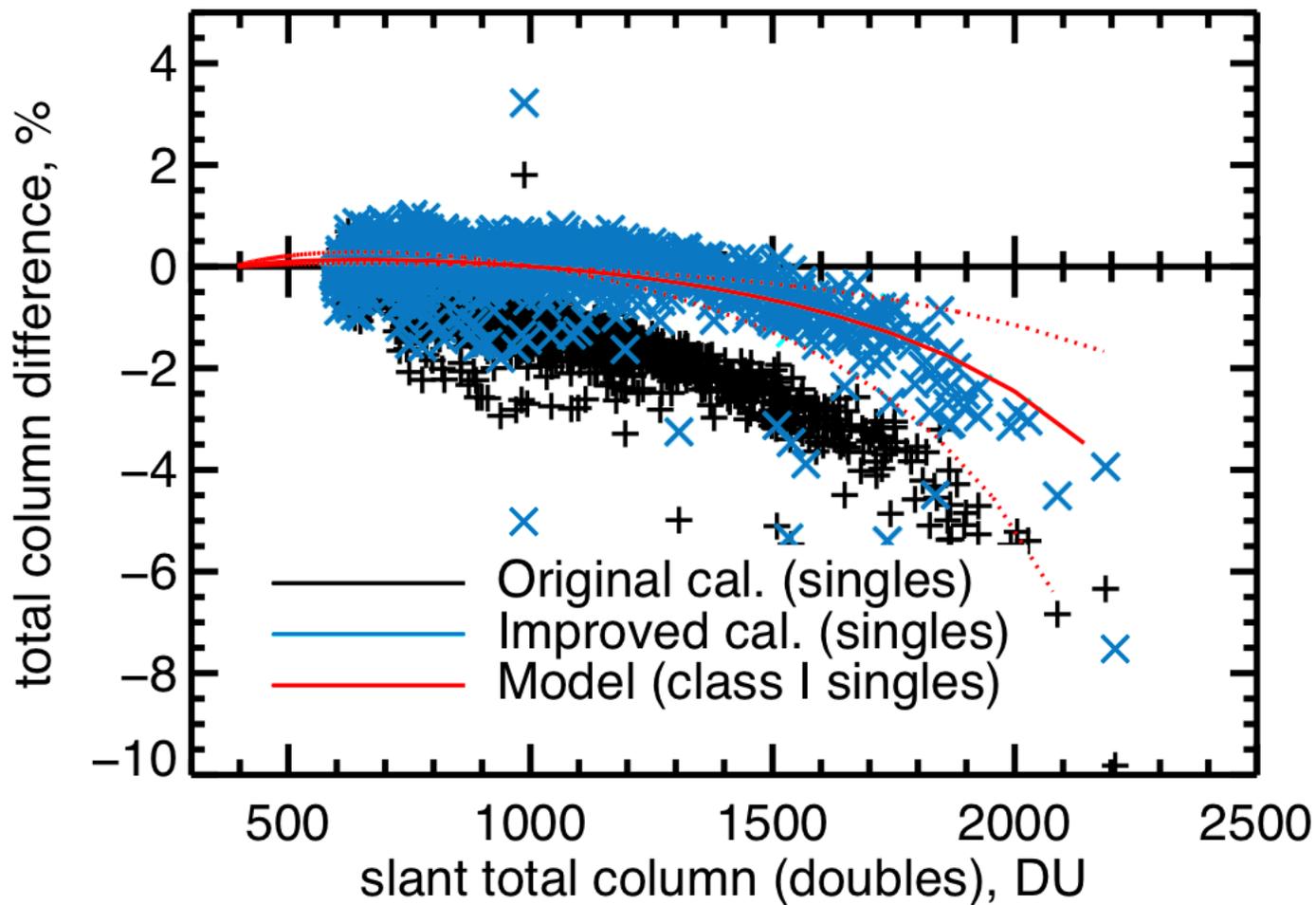
SAUNA Brewer ozone measurements

doubles vs. singles, April 30



SAUNA Brewer ozone measurements

Stray-light: singles vs. doubles



SAUNA (column) summary

- SAUNA behavior seen at other high and mid-latitude sites
- Data from double Brewers should be used for Aura ozone validation at high solar zenith angles
- The state of the network calibration (Brewer and Dobson) are uncertain and may require improvements
- With improved GB calibration, differences most probably due to ozone X-sections uncertainties
 - High spectral resolved X-section required which can be used by both satellites and ground-based instruments