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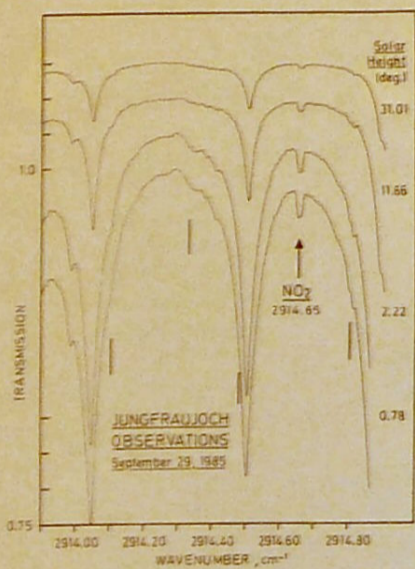
Geophysics Research Laboratory
University of Tokyo, Japan

K. SHIBASAKI

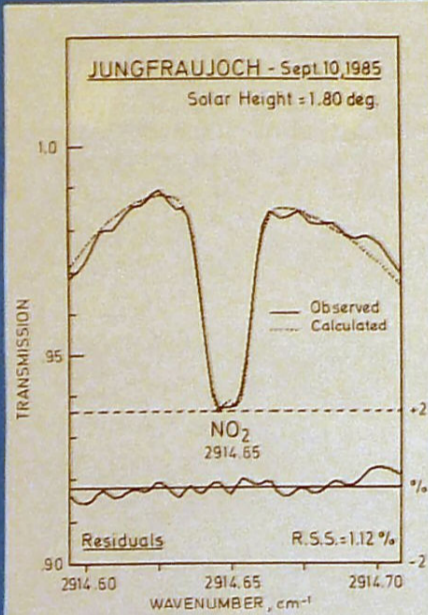
Kokugakuin University
Shibuya-Ku, Japan

TECHNIQUES INVOLVED

IR DIRECT SUN OBSERVATIONS Jungfraujoch, Switzerland



TYPICAL SAMPLE SPECTRA RECORDED AT THE JUNGFRAUJOCH WITH THE FTIS (SPECTRAL RESOLUTION OF 0.005 cm⁻¹), SHOWING THE TARGET NO₂ MANIFOLD ABSORPTION AT 2914.65 cm⁻¹. THE TICK MARKS INDICATE THE POSITIONS OF OTHER NO₂ ABSORPTIONS.



EXAMPLE OF FITTING THE NO₂ ABSORPTION FEATURE AT 2914.65 cm⁻¹ OBSERVED AT ISSJ FOR A SOLAR ELEVATION ANGLE OF 1.80 DEGREES.

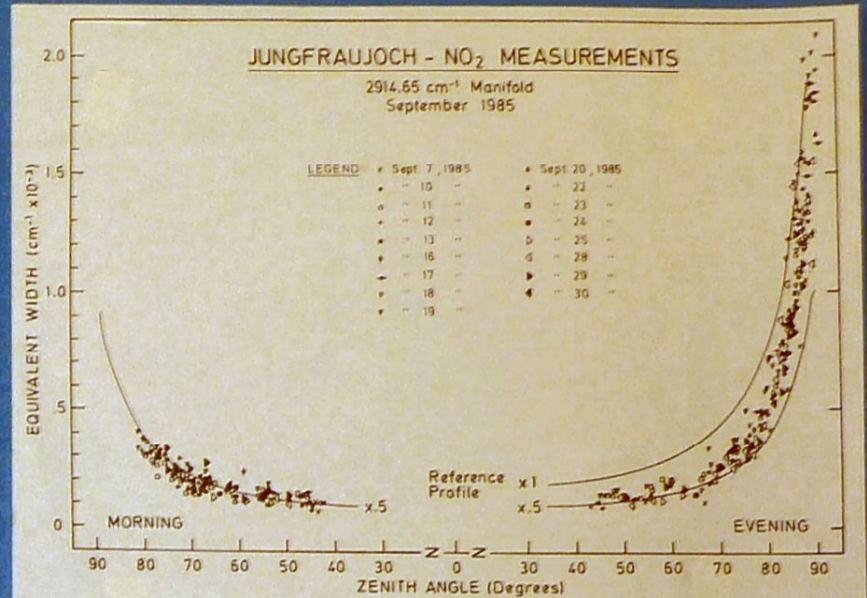
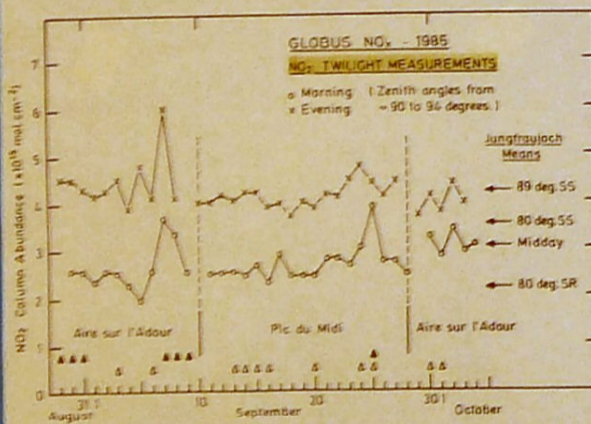


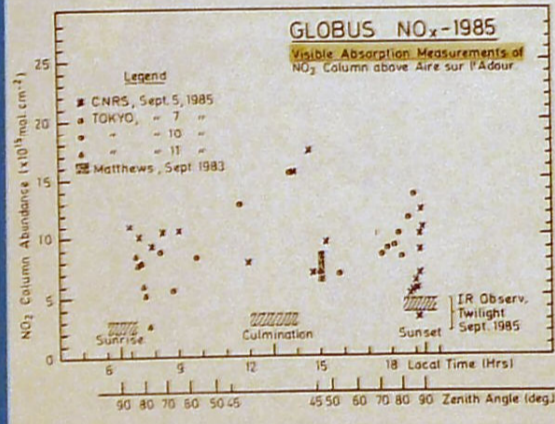
Figure 2 GRAPHICAL REPRESENTATION OF THE EQUIVALENT WIDTH MEASUREMENTS OF THE NO₂ MANIFOLD AT 2914.65 cm⁻¹, VERSUS ZENITH ANGLE, OBSERVED AT ISSJ DURING SEPTEMBER 1985. THE ZENITH CURVES OF GROWTH CORRESPONDING TO A "TYPICAL REFERENCE" PROFILE (x1) AND TO HALF OF ITS CONCENTRATIONS (x.5) ARE DRAWN TO VISUALIZE THE ASYMMETRY BETWEEN THE MORNING AND EVENING OBSERVATIONS.

VISIBLE TWILIGHT OBSERVATIONS Aire sur l'Adour and Pic du Midi Southern France



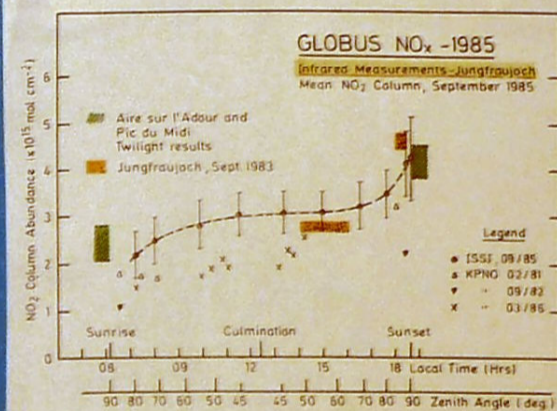
EVOLUTION OF THE NO₂ COLUMN ABUNDANCE AT AIRE SUR L'ADOUR AND AT PIC DU MIDI BETWEEN AUGUST 28 AND OCTOBER 5, 1985, OBTAINED BY THE TWILIGHT METHOD AT SUNRISE AND AT SUNSET. THE FULL TRIANGLES INDICATE DAYS WITH THUNDERSTORM ACTIVITY OVER NORTHERN SPAIN AND THE PYRENEES. THE OPEN TRIANGLES IDENTIFY DAYS WITH OVERCAST SKY.

VISIBLE DIRECT SUN OBSERVATIONS Aire sur l'Adour, Southern France

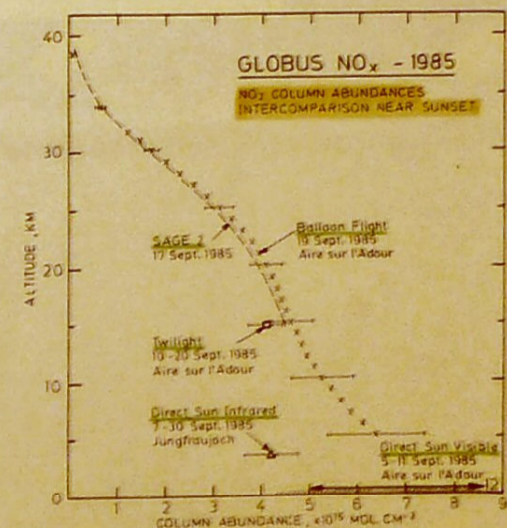


NO₂ COLUMN ABUNDANCES ABOVE AHA DERIVED FROM DIRECT SUN VISIBLE OBSERVATIONS MADE BETWEEN SEPTEMBER 5 AND 11. THE MAGNITUDES OF THE COLUMNS AND THEIR VARIABILITY SUGGEST THE OCCURRENCE OF FREQUENT LOCAL BOUNDARY LAYER POLLUTION.

RESULTS



NEAR SEPTEMBER 1985 COLUMN ABUNDANCE OF NO₂ AT DISCRETE ZENITH ANGLES, DERIVED FROM THE ENSEMBLE OF THE EQUIVALENT WIDTHS GIVEN IN FIG. 2, AND SHOWING CLEARLY THE COLUMN'S DAYTIME VARIATION. THE ERROR BARS CORRESPOND TO ONE STANDARD DEVIATION AROUND THE MEAN. OTHER RESULTS ARE REPRODUCED FOR COMPARISON PURPOSES.



COMPARISON OF THE ORIGINAL NEAR-SUNSET COLUMN ABUNDANCES PRESENTED IN THIS PAPER WITH RESULTS DERIVED FROM QUASI-SIMULTANEOUS BALLOON AND SATELLITE OBSERVATIONS.

OVERALL NEAR-SUNSET INTERCOMPARISON

CONCLUSIONS

1.- A-PRIORI, NO BASIC INCONSISTENCY AMONG RESULTS

2.- IMPROVE UNDERSTANDING AND SLANT-PATH APPLICABILITY OF DIURNAL VARIATION OF NO₂

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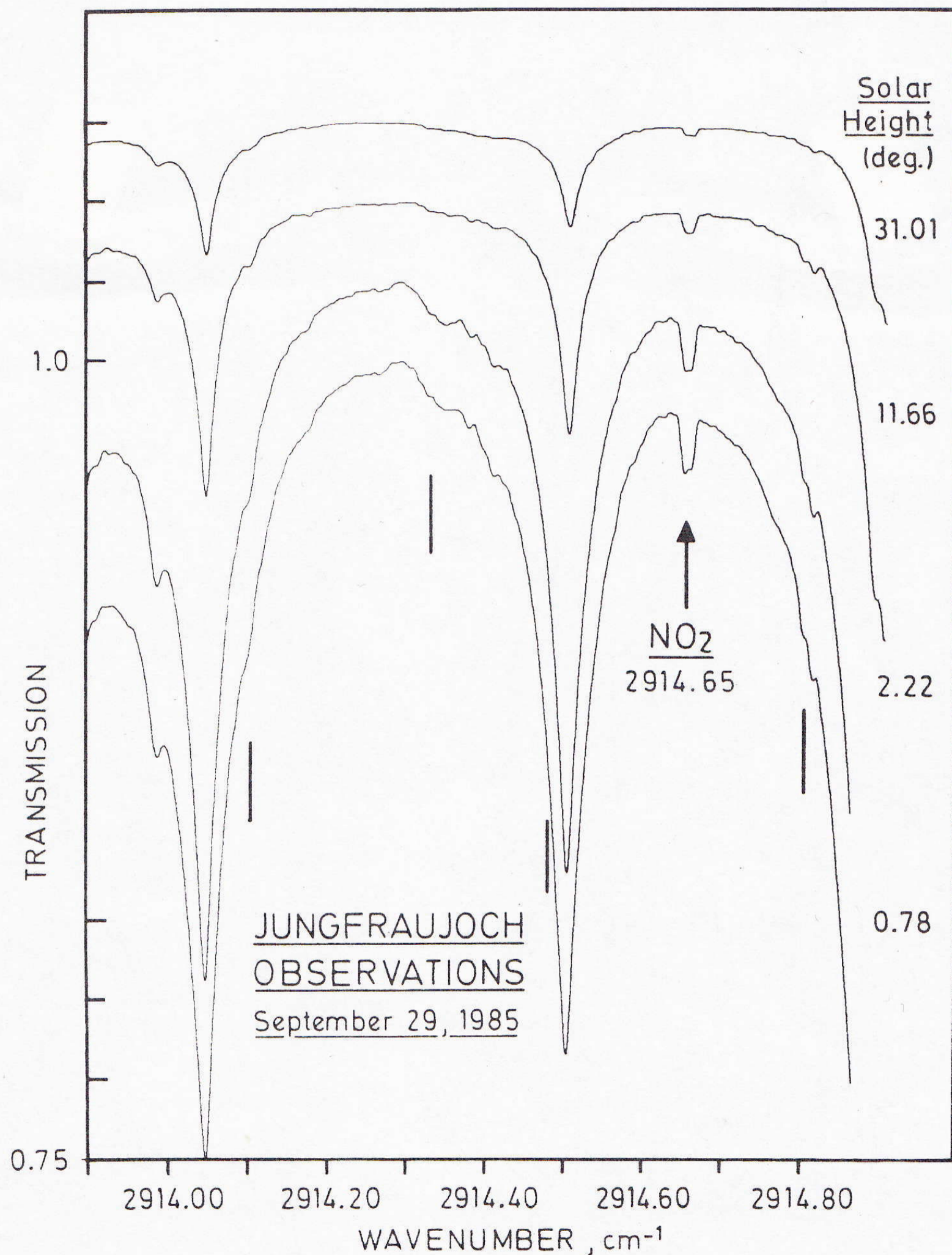
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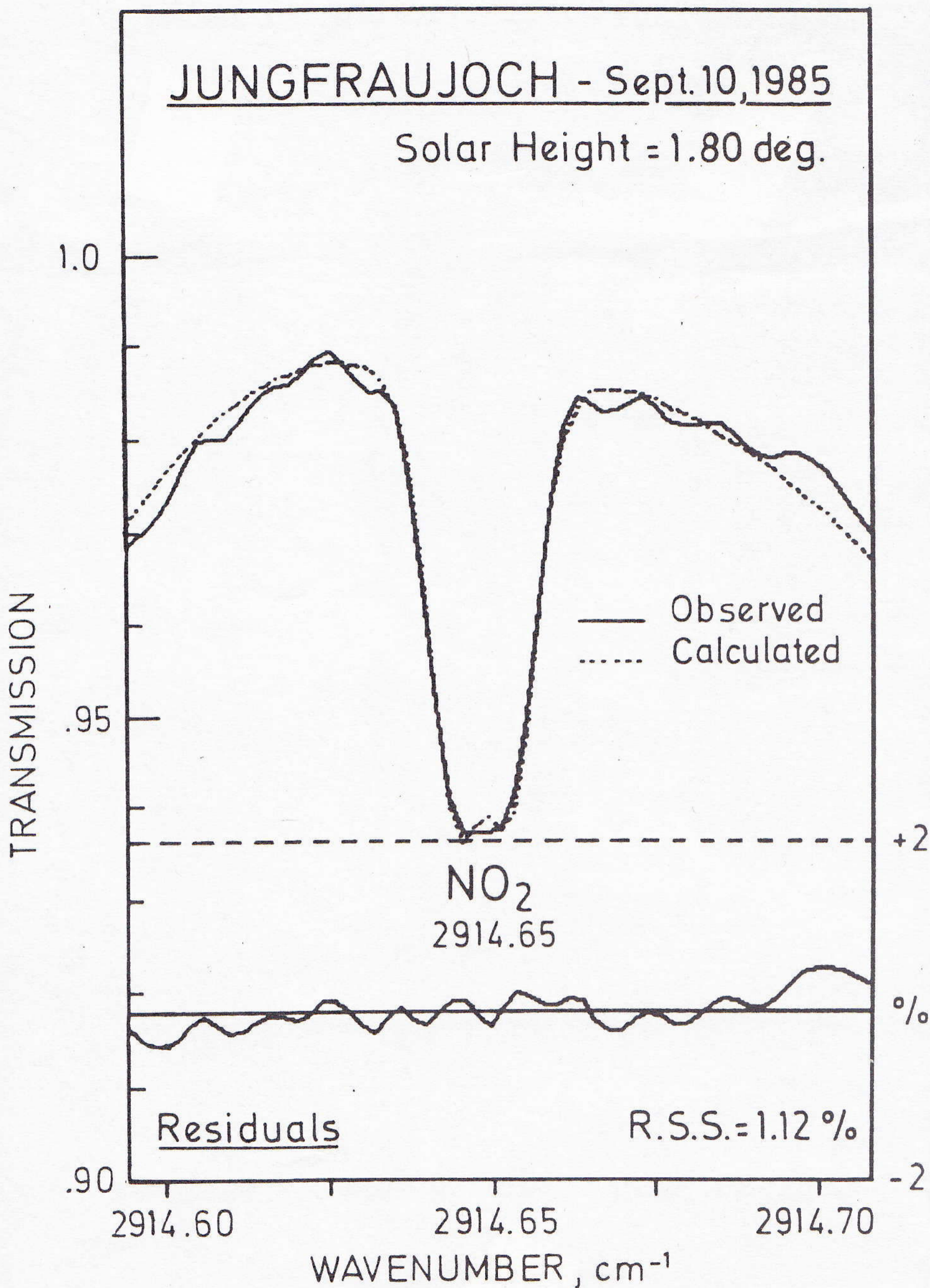
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TYPICAL SAMPLE SPECTRA RECORDED AT THE JUNGFRAUJOCH WITH THE FTS (SPECTRAL RESOLUTION OF 0.005 cm^{-1}), SHOWING THE TARGET NO_2 MANIFOLD ABSORPTION AT 2914.65 cm^{-1} . THE TICK MARKS INDICATE THE POSITIONS OF OTHER NO_2 ABSORPTIONS.

JUNGFRAUJOCH - Sept. 10, 1985

Solar Height = 1.80 deg.



EXAMPLE OF FITTING THE NO₂ ABSORPTION FEATURE AT 2914.65 cm⁻¹ OBSERVED AT ISSJ FOR A SOLAR ELEVATION ANGLE OF 1.80 DEGREES.

JUNGFRAUJOCH - NO₂ MEASUREMENTS

2914.65 cm⁻¹ Manifold
September 1985

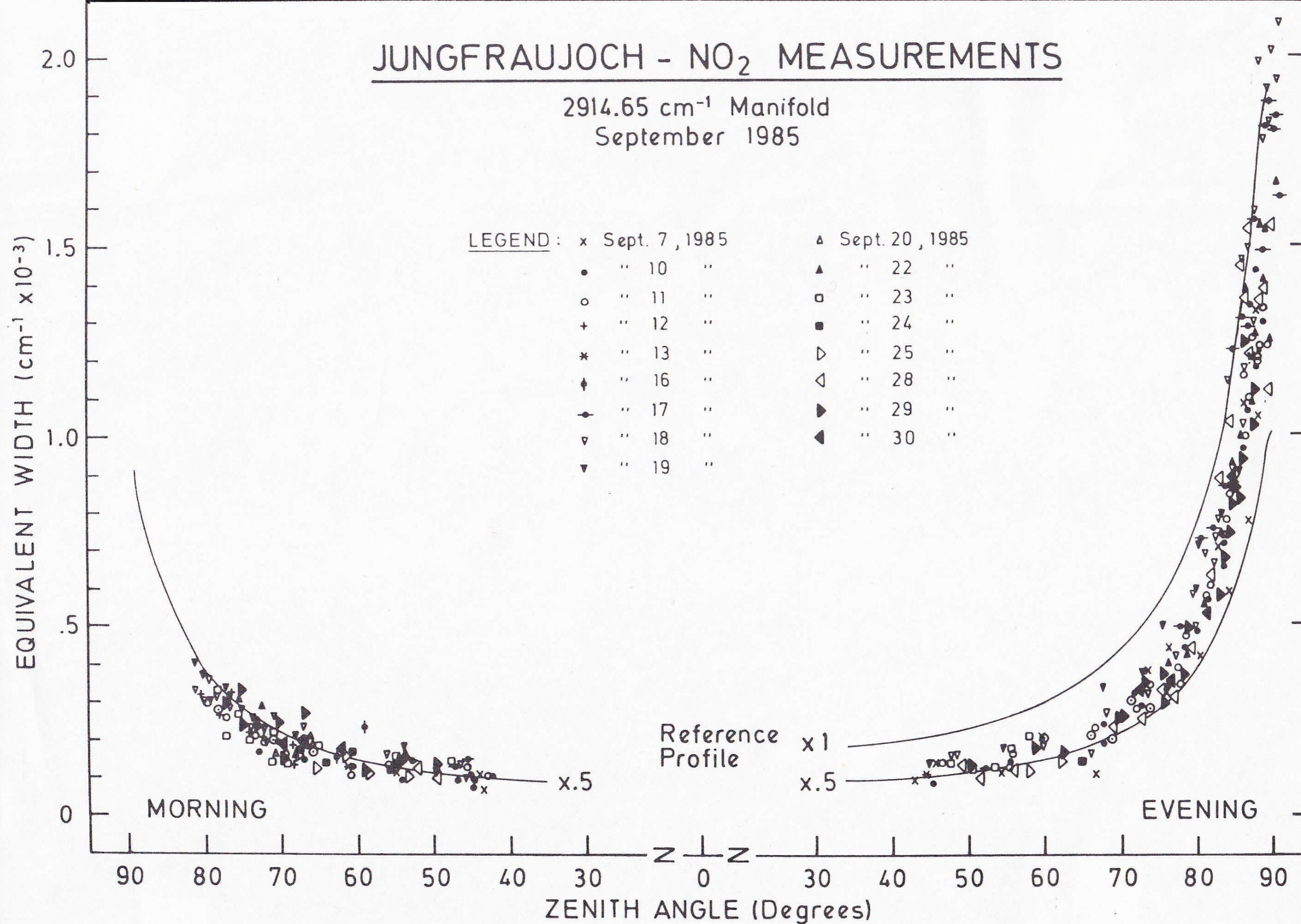
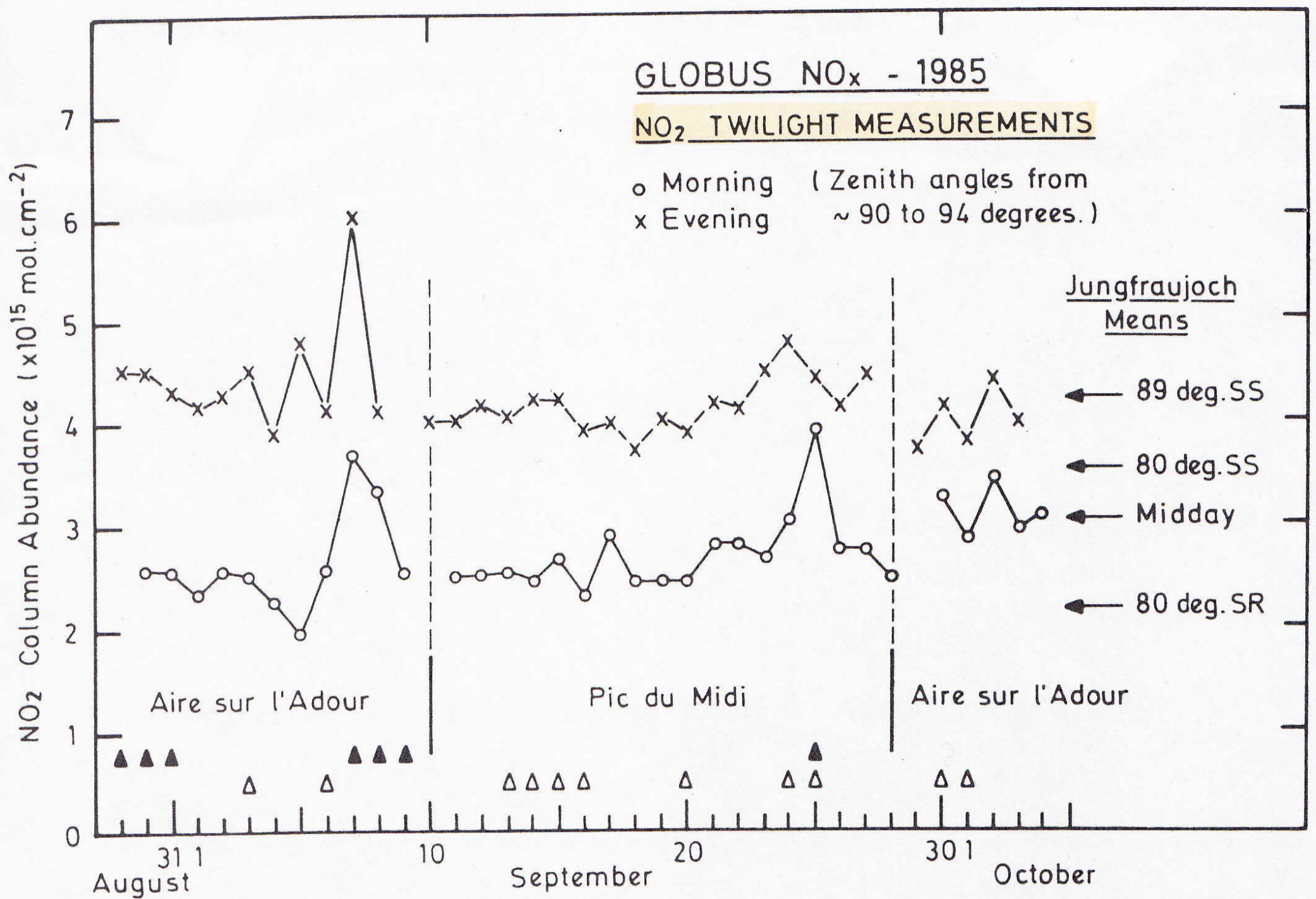


Figure 2

GRAPHICAL REPRESENTATION OF THE EQUIVALENT WIDTHS MEASUREMENTS OF THE NO₂ MANIFOLD AT 2914.65 cm⁻¹, VERSUS ZENITH ANGLE, OBSERVED AT ISSJ DURING SEPTEMBER 1985. THE ZENITH CURVES OF GROWTH CORRESPONDING TO A "TYPICAL REFERENCE" PROFILE (x1) AND TO HALF OF ITS CONCENTRATIONS (x.5) ARE DRAWN TO VISUALIZE THE ASSIMETRY BETWEEN THE MORNING AND EVENING OBSERVATIONS.

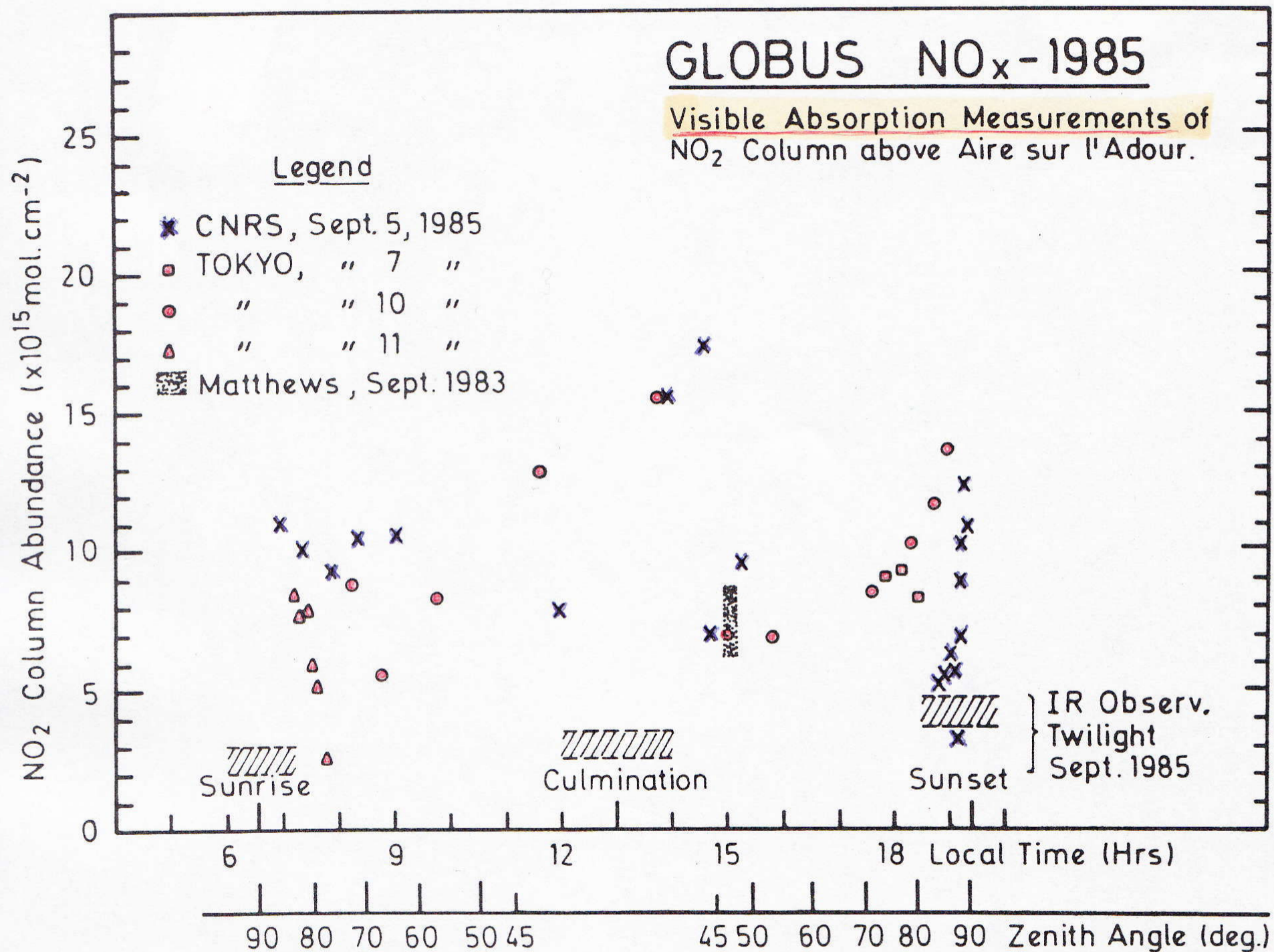
VISIBLE TWILIGHT OBSERVATIONS Aire sur l'Adour and Pic du Midi Southern France



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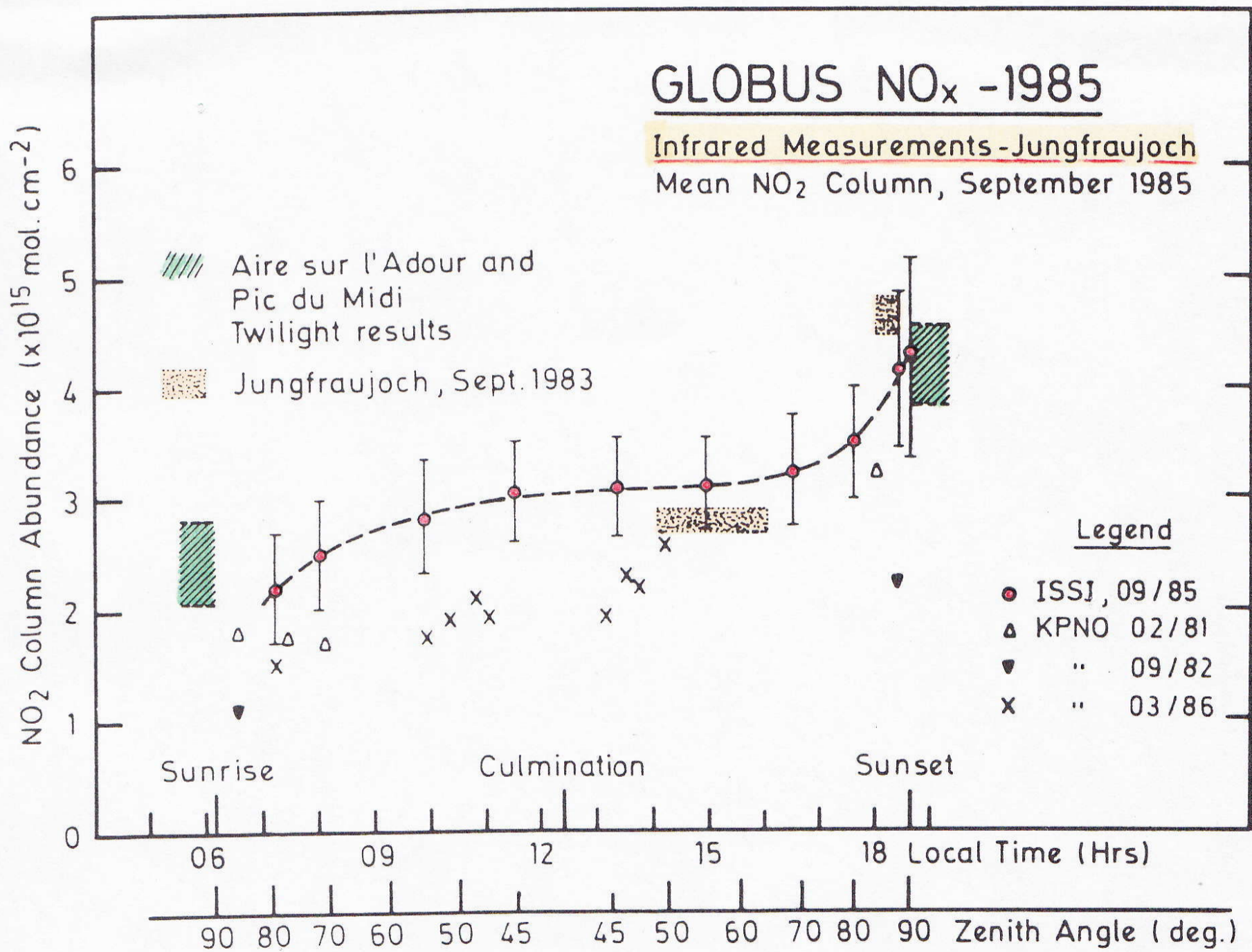
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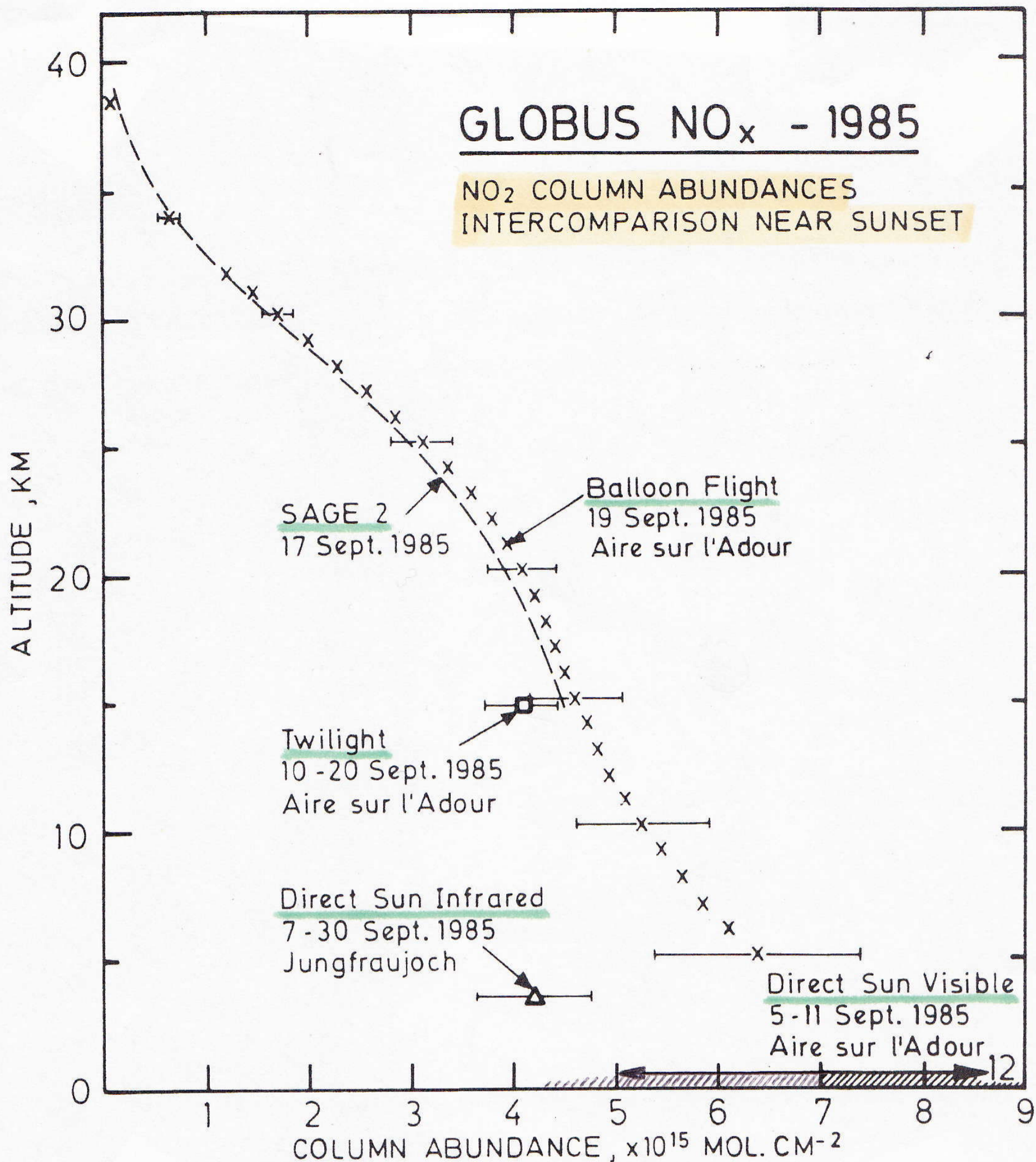


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