



TIDI

System Modeling

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TIDI

Objectives

- **Assist instrument design and verify system performance**
- **Design operational modes**
- **Produce simulated data and test data analysis software**



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Outlines

- **Simulation routines**
- **Operational Modes**
- **Rotational Temperature**

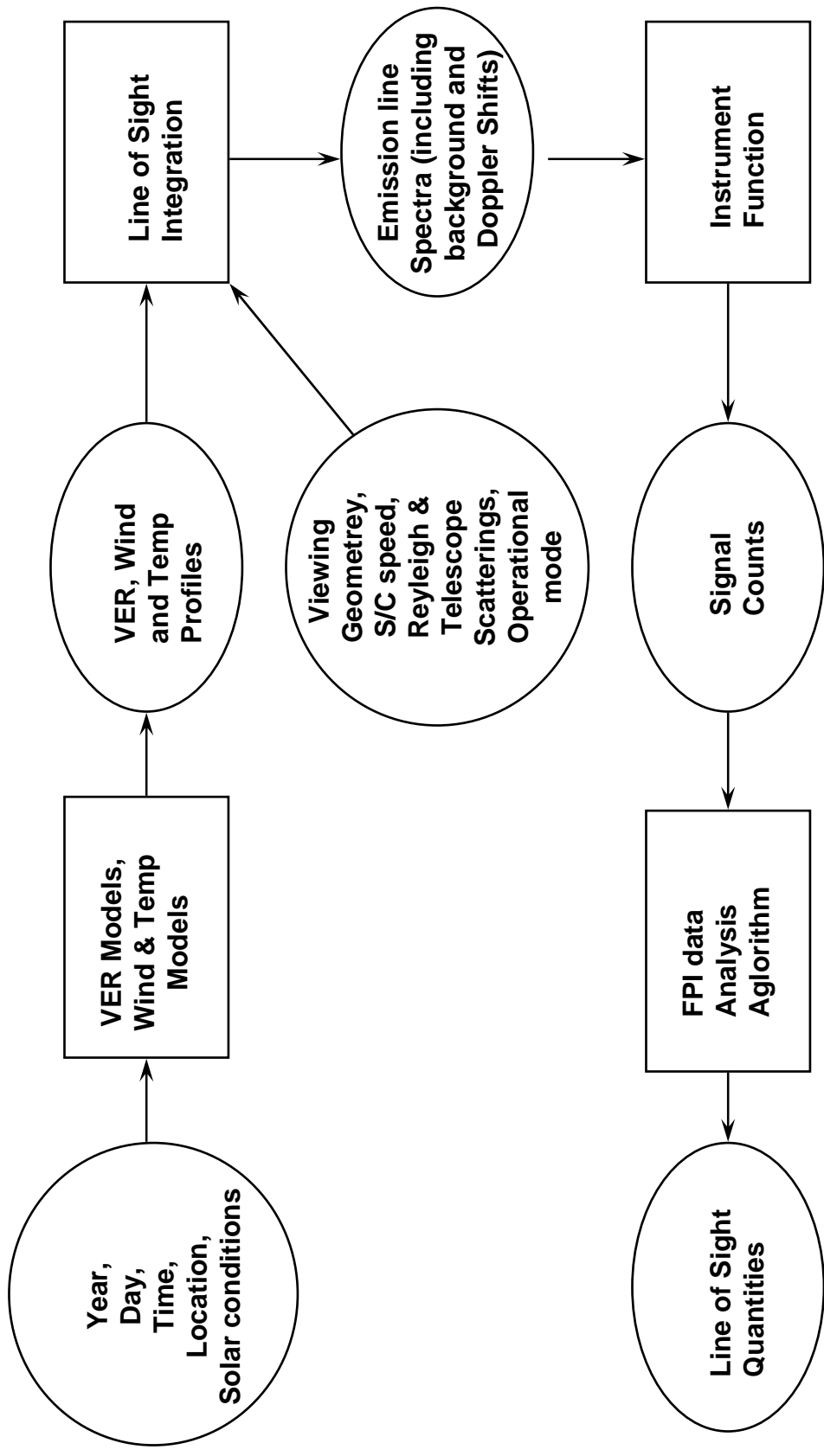


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Simulation Routines

- **Simulation routines**

Simulation Model Block Diagram

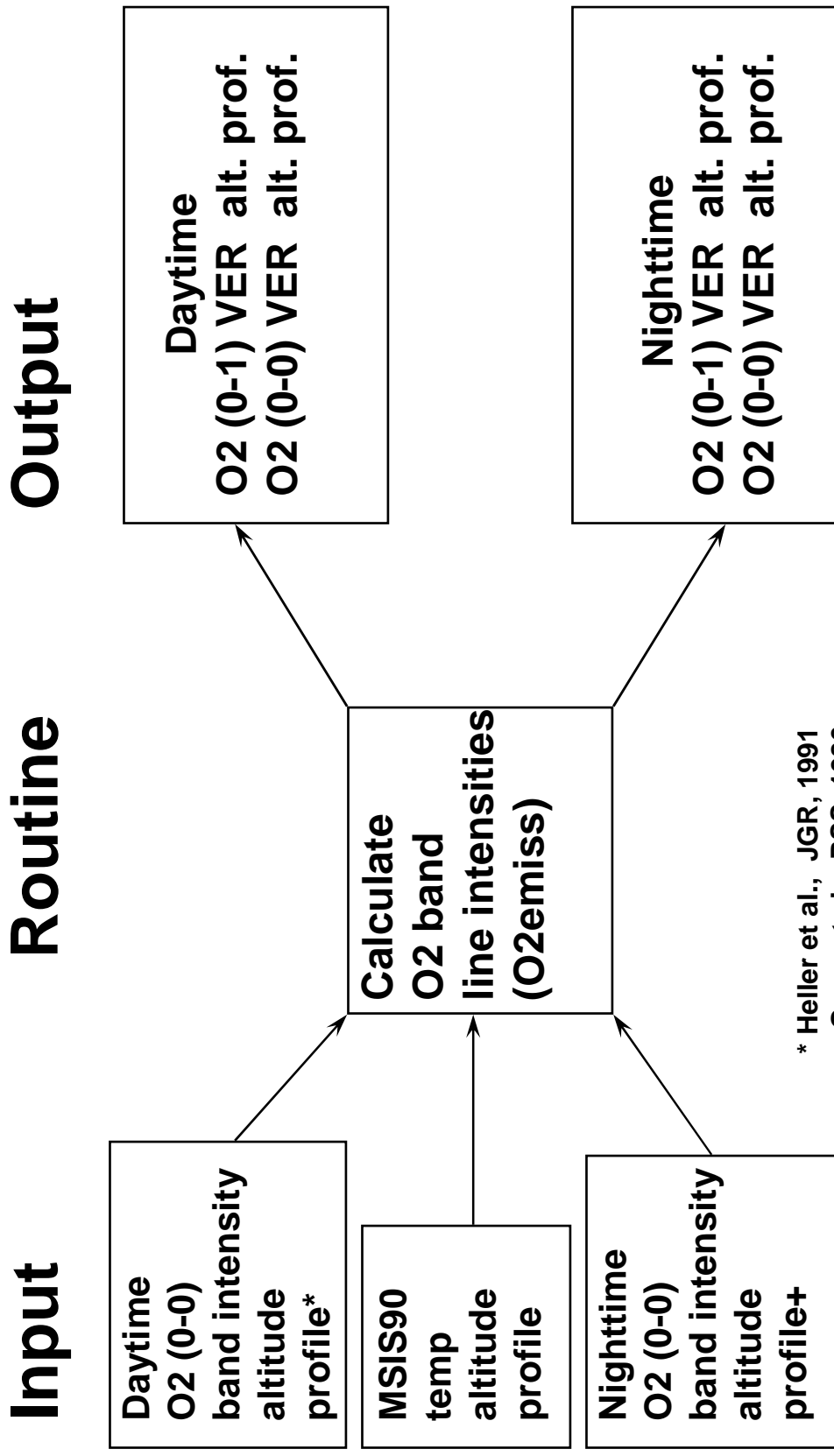




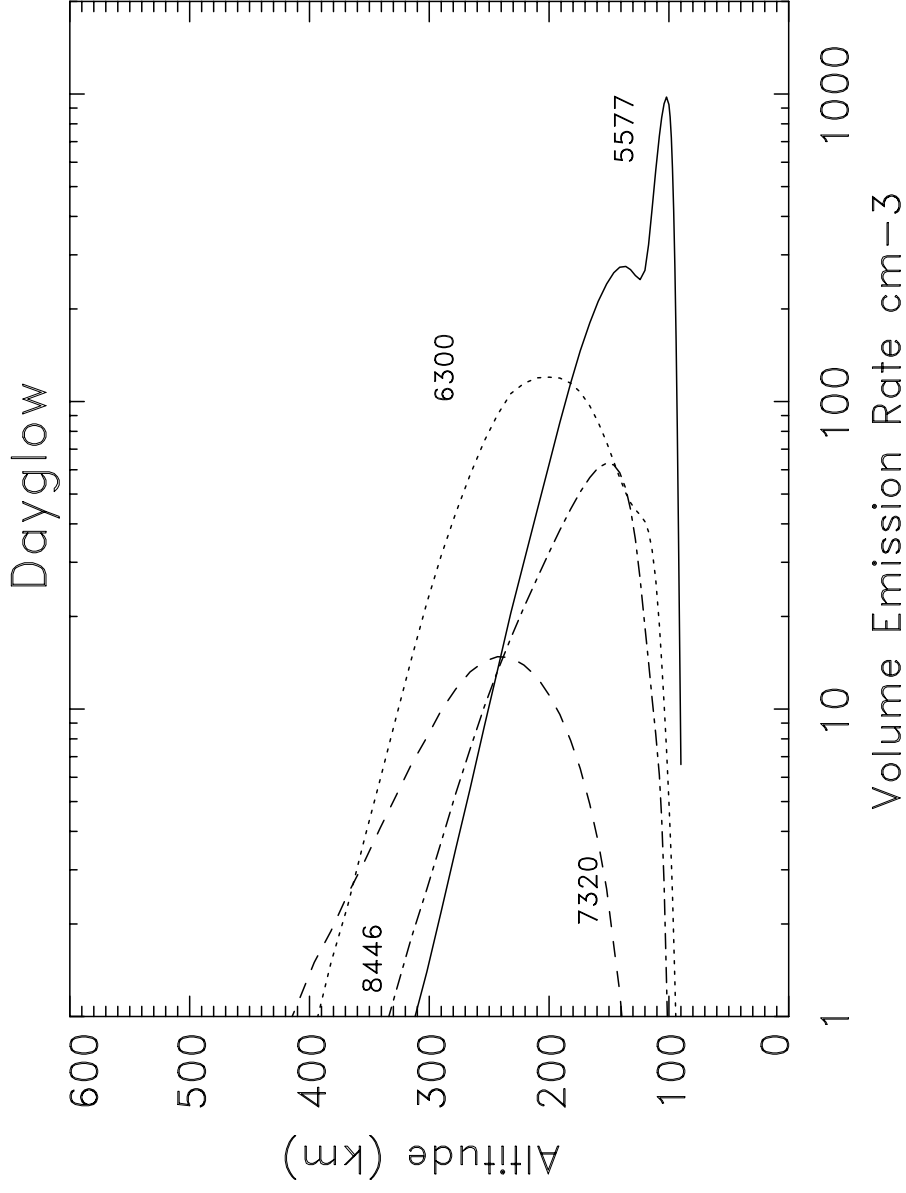
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Airglow and Wind models

Emission	Time	Models
6300	day & night	Solomon 1993
5577	day	Solomon 1993
8446	day	Solomon 1993
7320	day	Solomon 1993
5577	night	Greer et al. 1986
5893	night	Swider 1986
Temp		MSIS90
Wind		HWM93



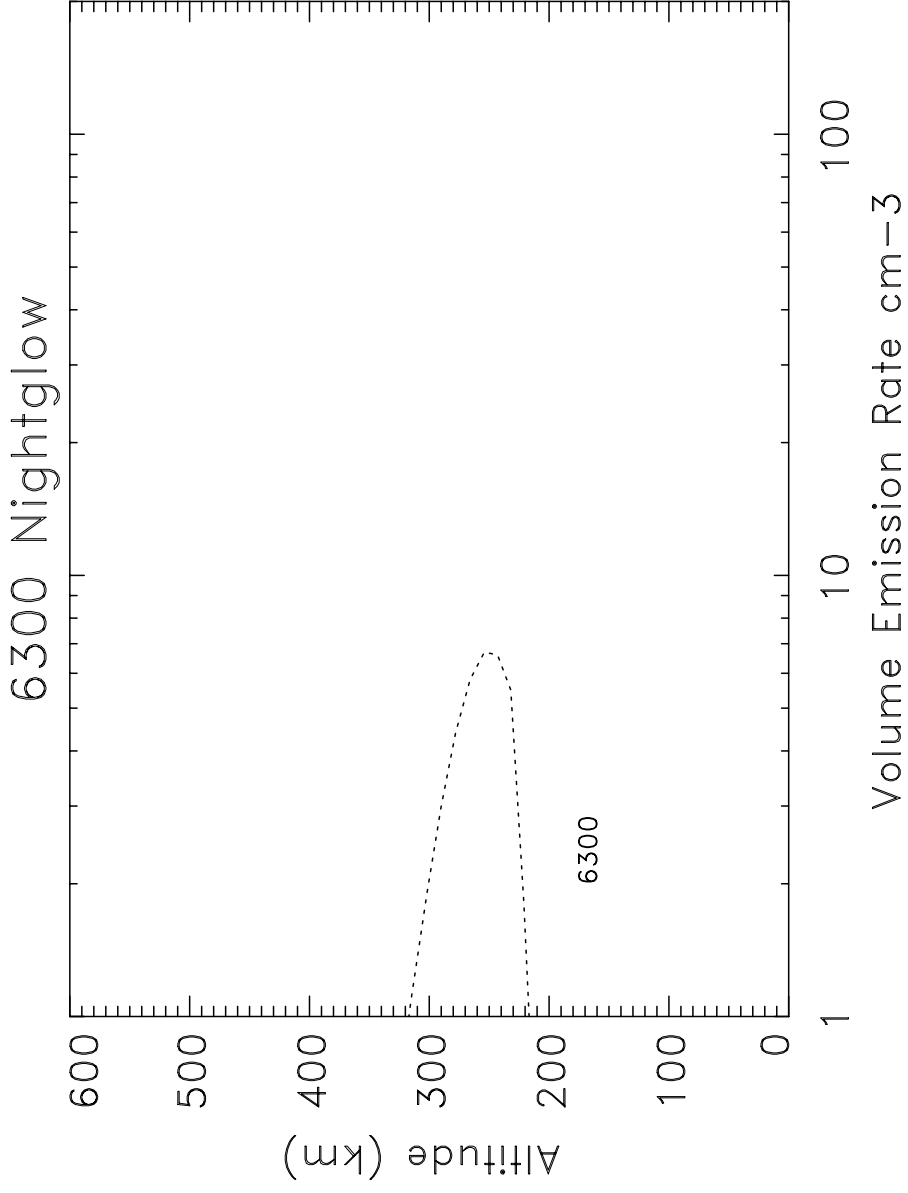
* Heller et al., JGR, 1991
+ Greer et al., PSS, 1986

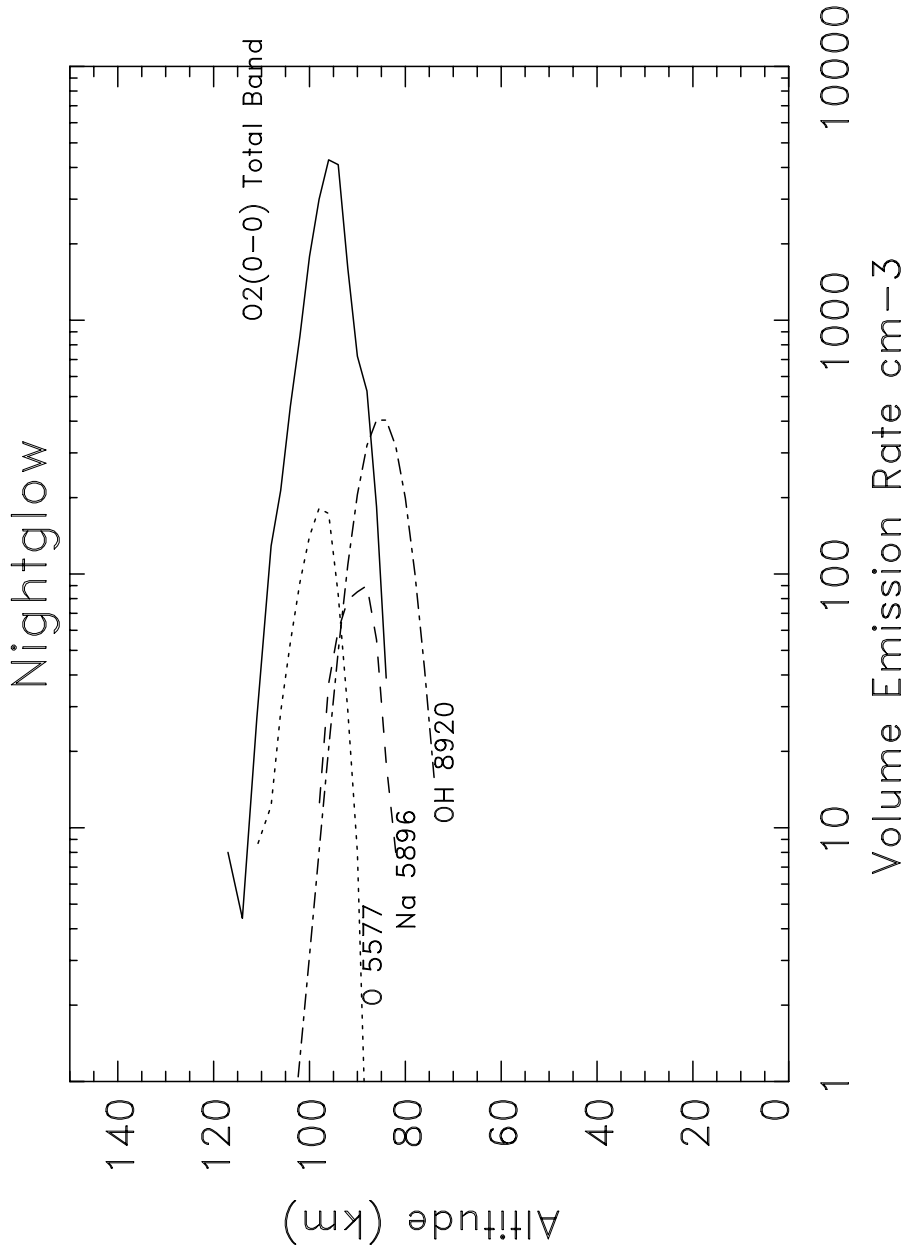




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6300 Nightglow Emission Rate







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Line of Sight Integration Routine

Input

Temp
Wind
VER
profiles
S/C Speed
Telescope
Rayleigh
scattering

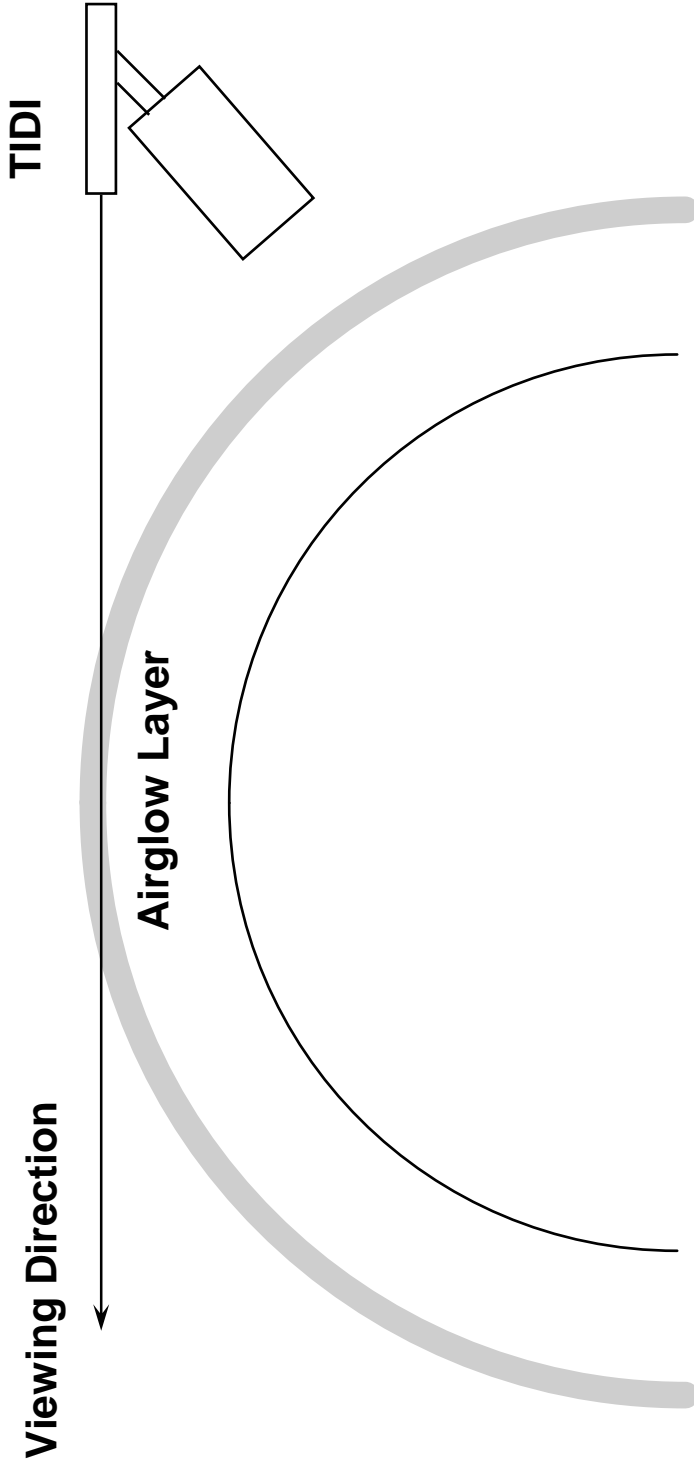
Routine

calculate line
sight brightness
from VER,
add Doppler
effects of
wind, temp,
and S/C speed;
and scattering
backgrounds
(intadd)

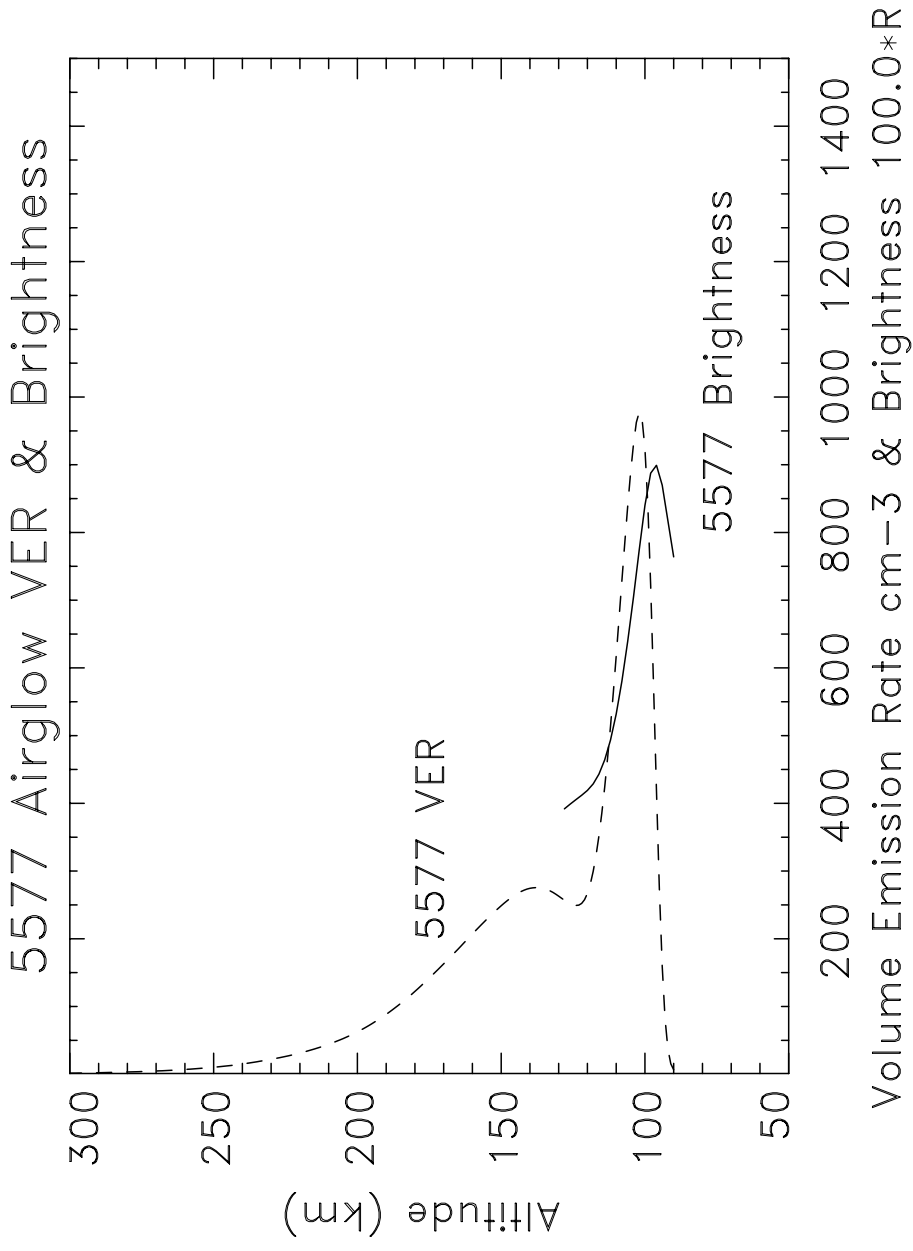
Output

Line of
Sight
Spectra
for four
telescopes

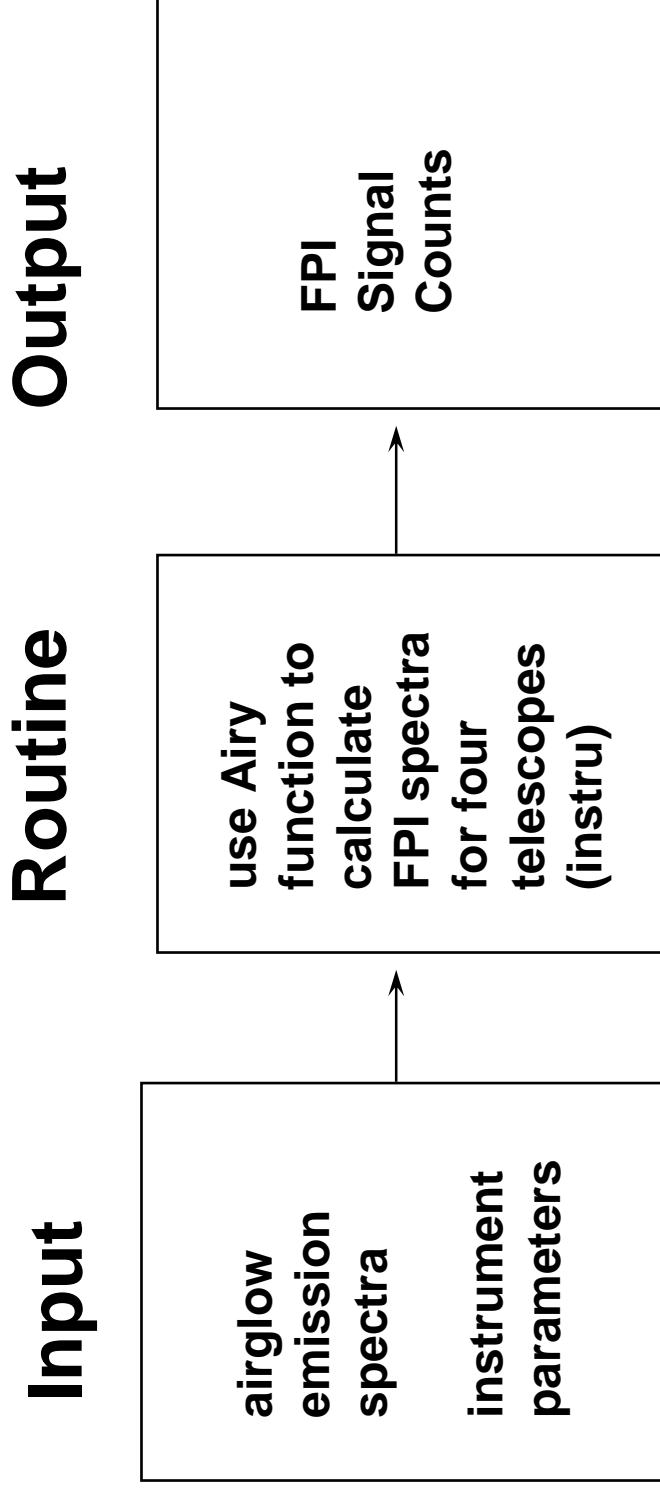
Line of Sight Geometry



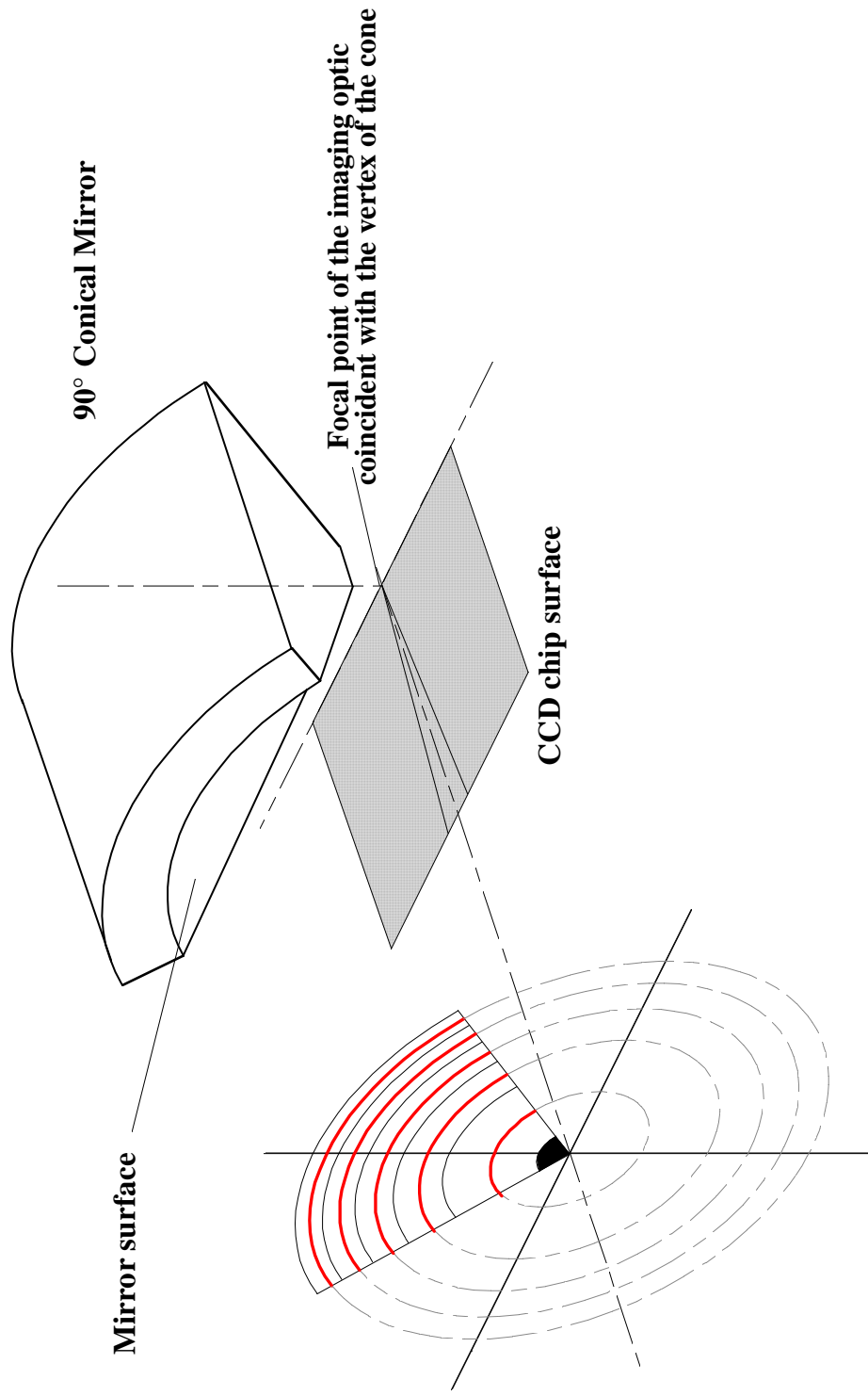
TIDI Line of Sight Integration Example



Instrument Function

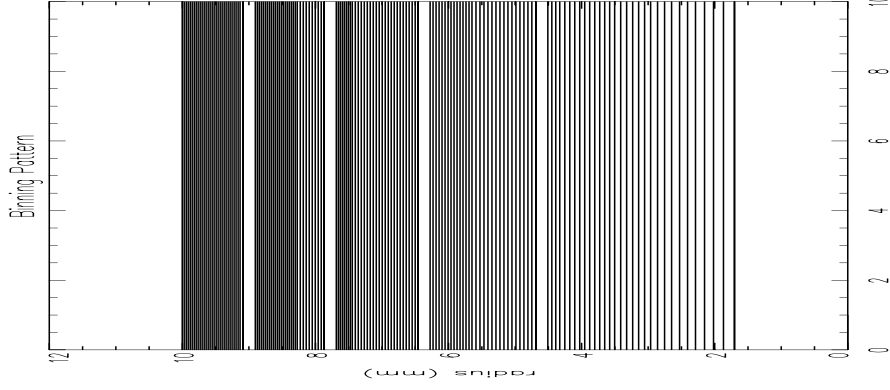


CLIO Configuration

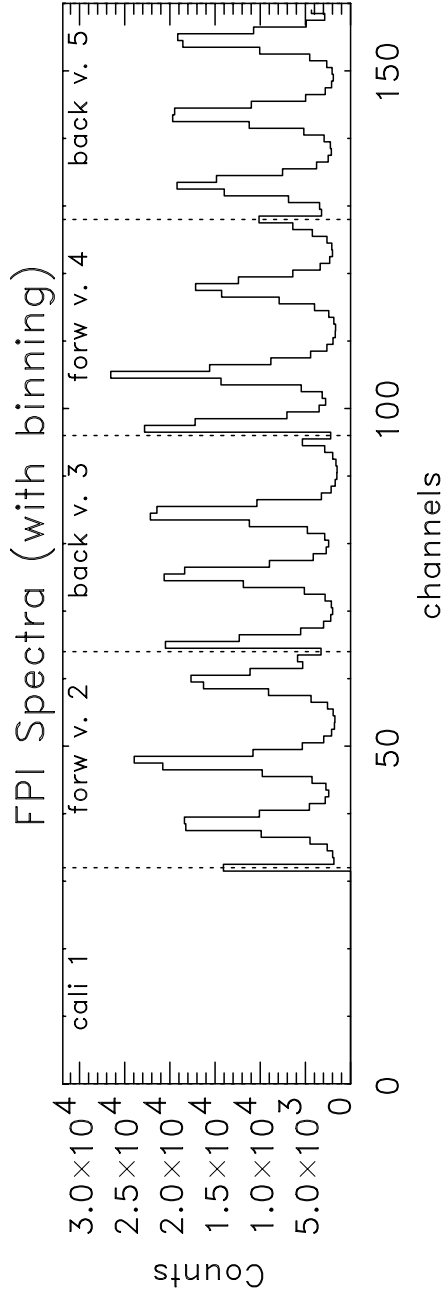
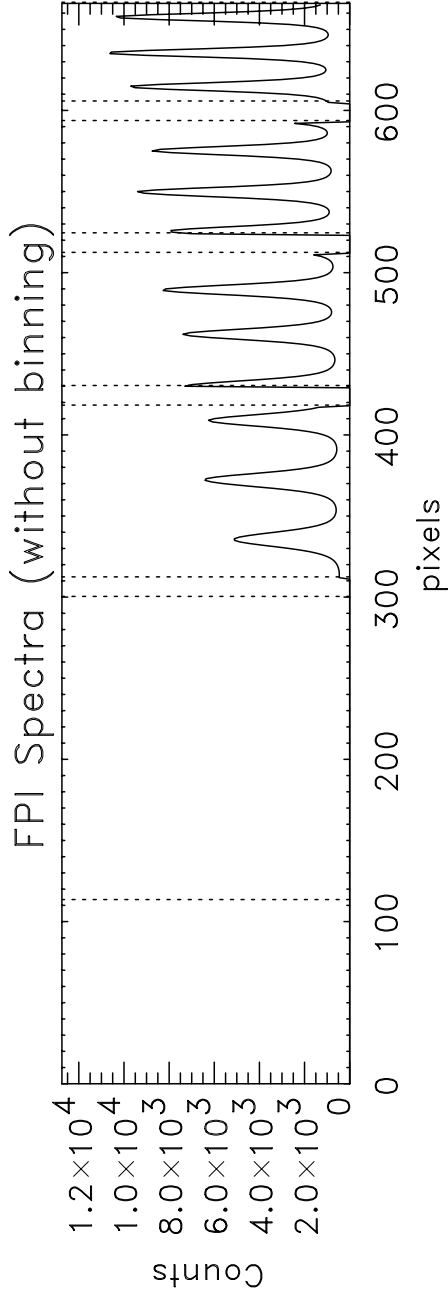


CCD Binning Pattern

Fields	1	2	3	4	5
11	4	3	3	3	3
10	4	3	3	3	2
9	4	3	3	3	2
8	4	3	3	3	2
8	4	3	3	3	2
8	4	3	3	3	2
7	4	3	3	3	2
7	4	3	3	3	2
7	4	3	3	2	2
6	4	3	3	2	2
6	4	3	3	2	2
6	4	3	2	2	2
6	4	3	2	2	2
6	4	3	2	2	2
6	4	3	2	2	2
6	4	3	2	2	2
6	4	3	2	2	2
5	3	3	2	2	2
5	3	3	2	2	2
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5	3	3	2	2	2
5	3	3	2	2	2
5	3	2	2	2	2
5	3	2	2	2	2
5	3	2	2	2	2
5	3	2	2	2	2
5	3	2	2	2	2
4	3	2	2	2	2
4	3	2	2	2	2
4	3	2	2	2	2
4	3	2	2	2	2
Total	187	106	82	69	61



CCD Pixel Binning





FPI Data Analysis Routine

Input

FPI
Signal
Counts

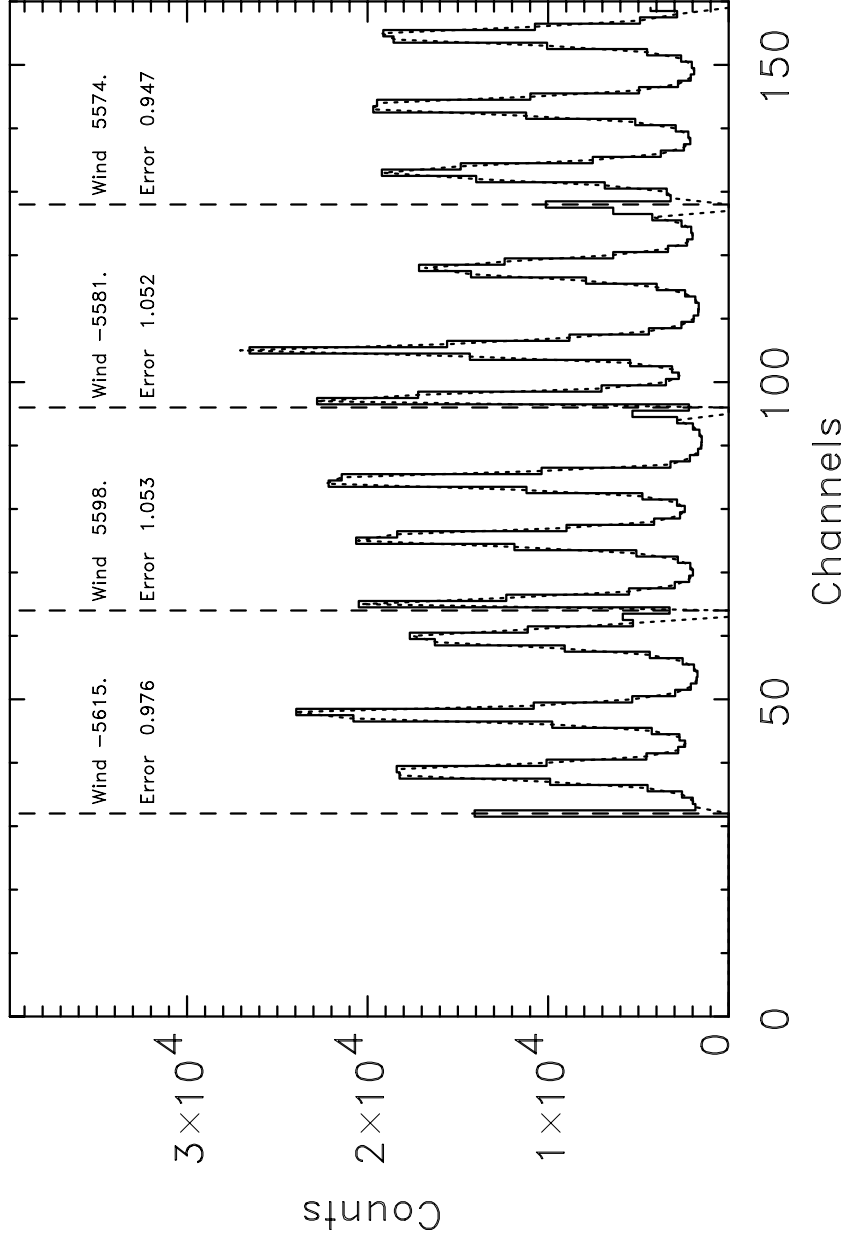
Routine

use least
square
fit routine
to retrieve
LOS
quantities
(Analysis)

Output

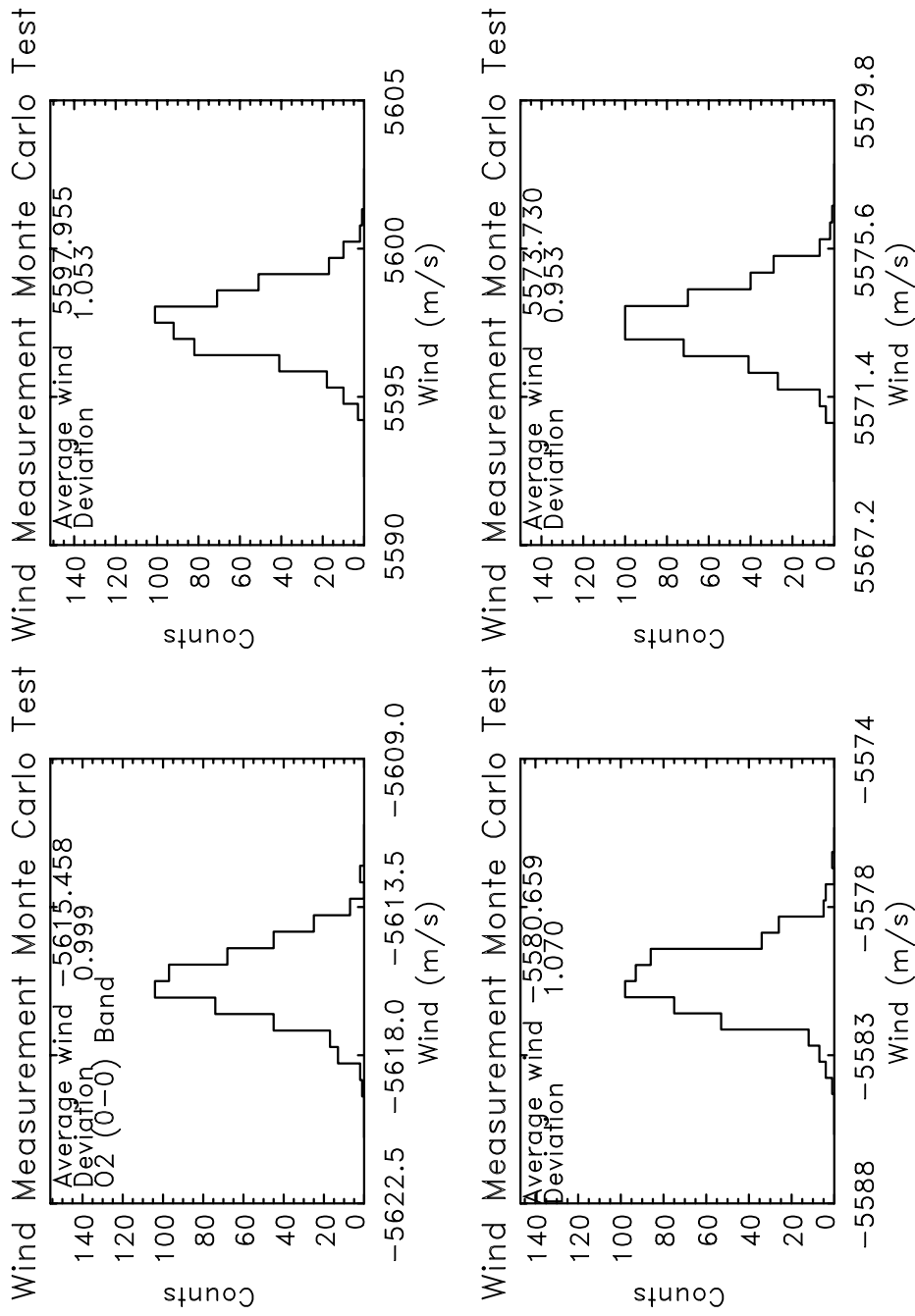
Wind
Temp
Brightness
Background
Measurements &
Errors

TIDI O2 (0-0) Band Spectra From The Four Telescopes





Monte Carlo Test of FPI Analysis



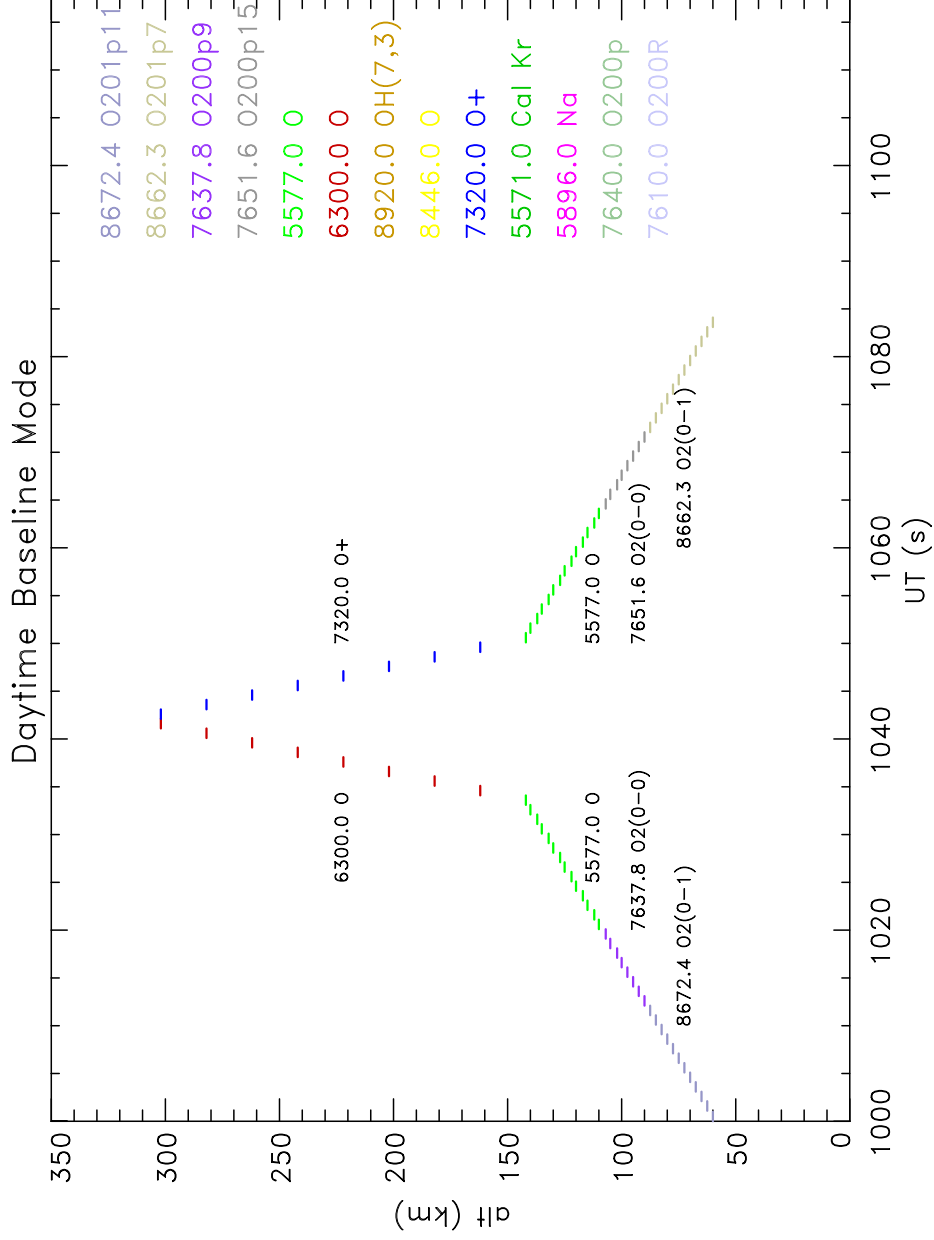


Operational Modes

- Operational Modes

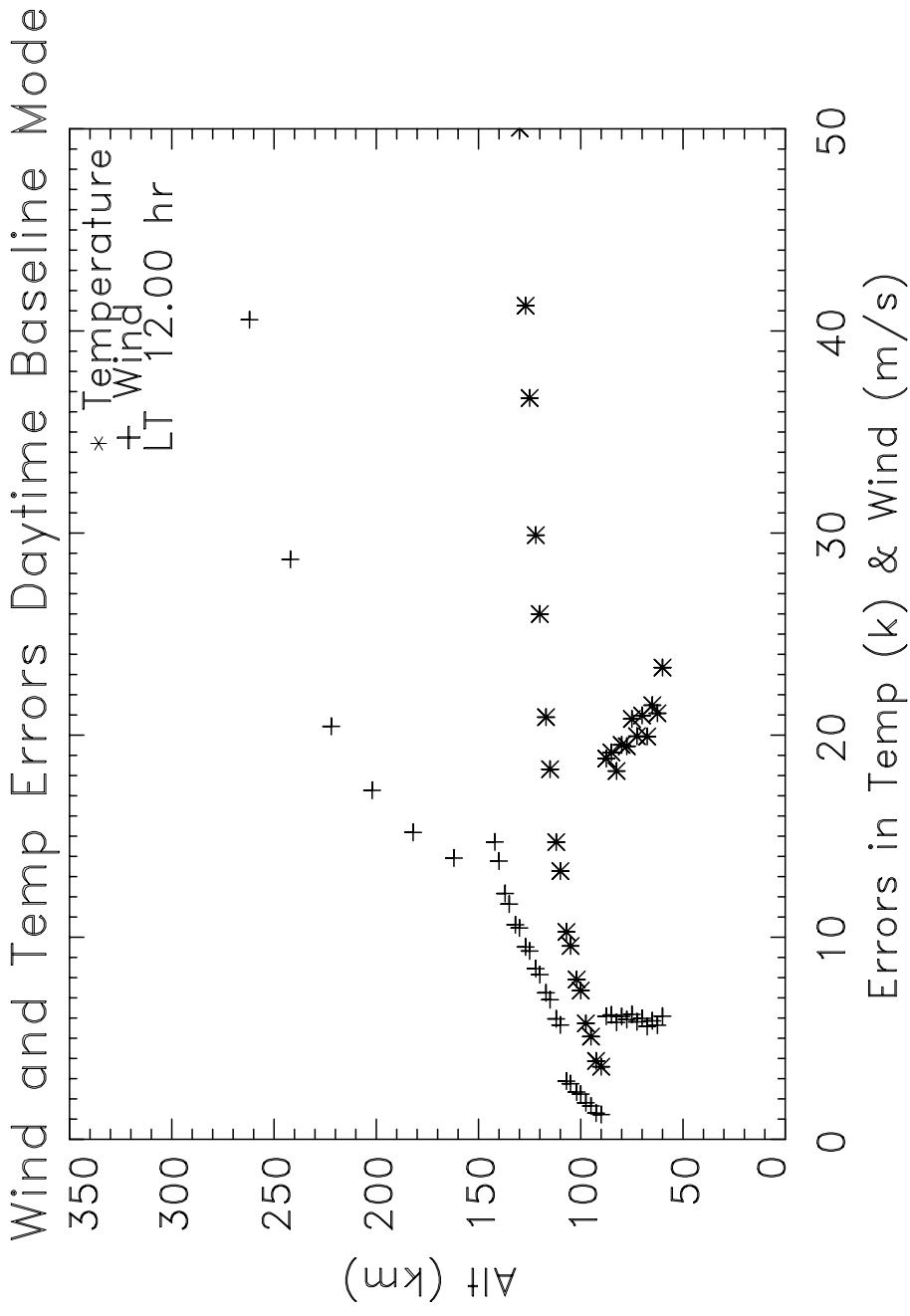


TIDI Daytime Baseline Operational Mode





Baseline Mode Errors



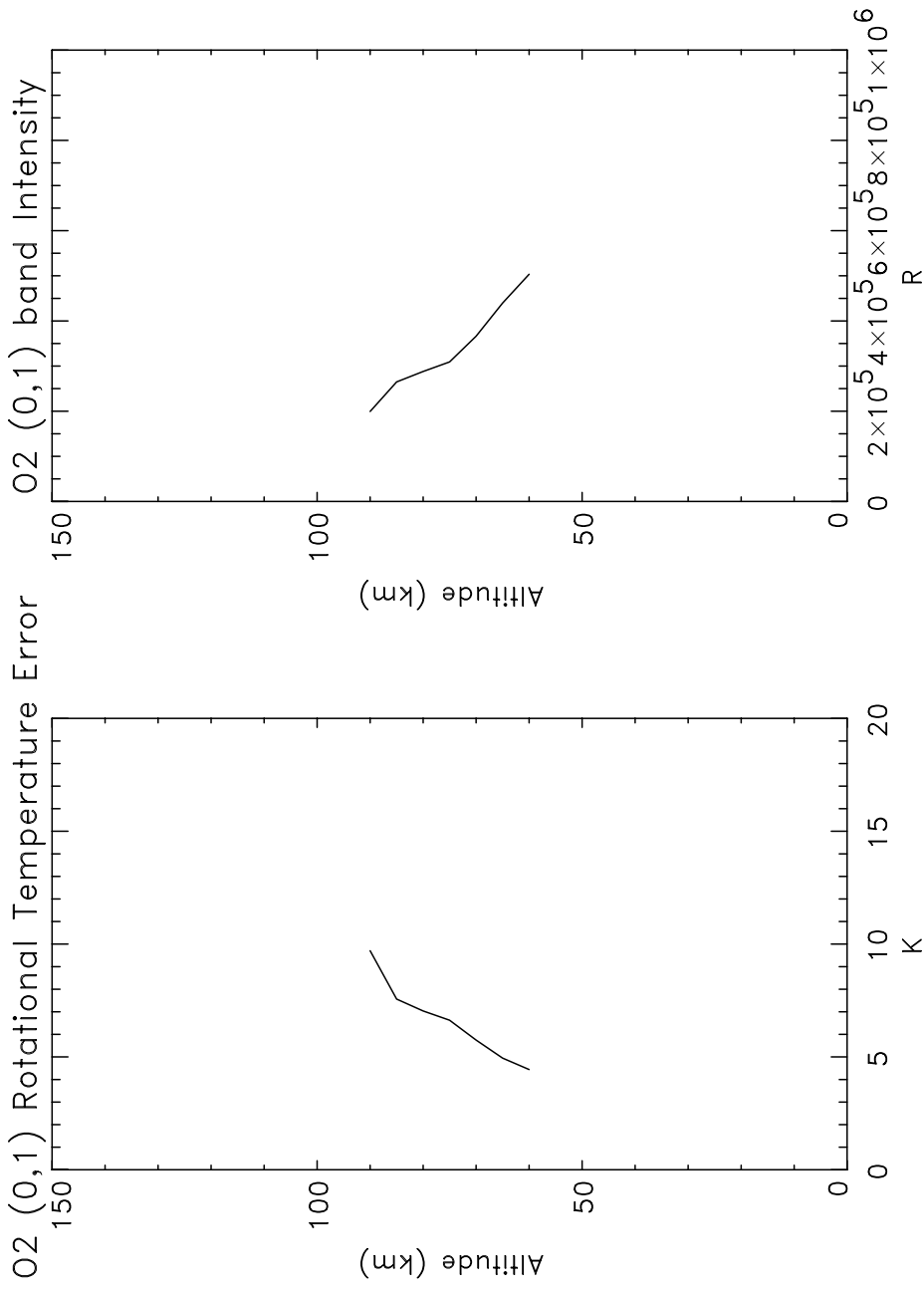


Rotational Temp Measurements

- Rotational Temperature Measurements



O2 (0-1) Rotational Temp Errors





O2 (0-0) Rotational Temp Errors

