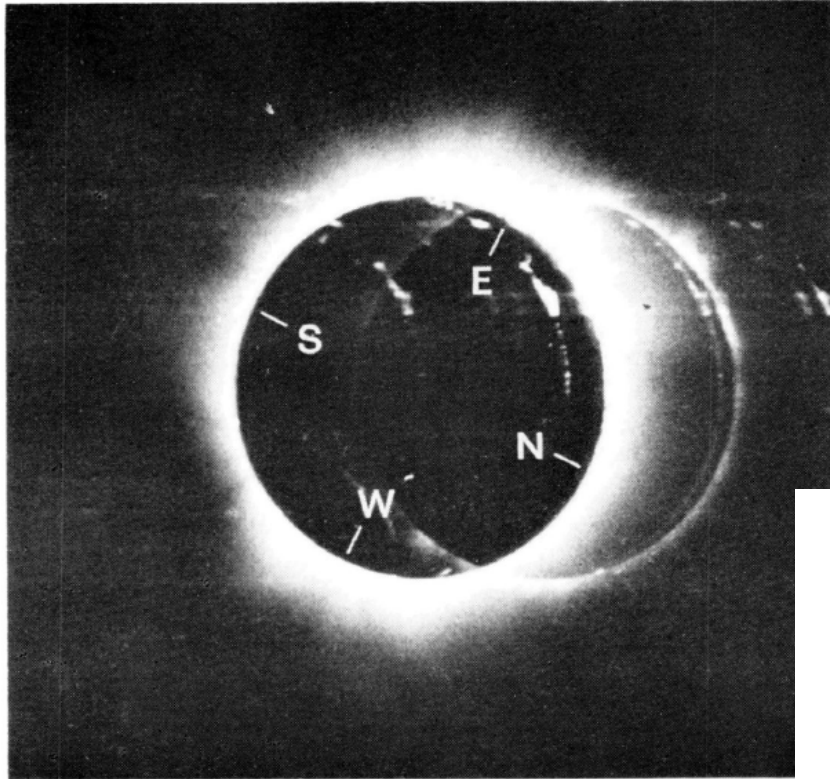


# **From Solar Hydrogen $L\alpha$ (1970) to Hydrogen $L\alpha$ (2009)**

*P. Lemaire*

*From Royal Astronomical Society meeting (1971) to Sumer observations (2009)*



*Gabriel, 1971, Sol.Phys. 21, 392*

Solar eclipse (7 march 1970)

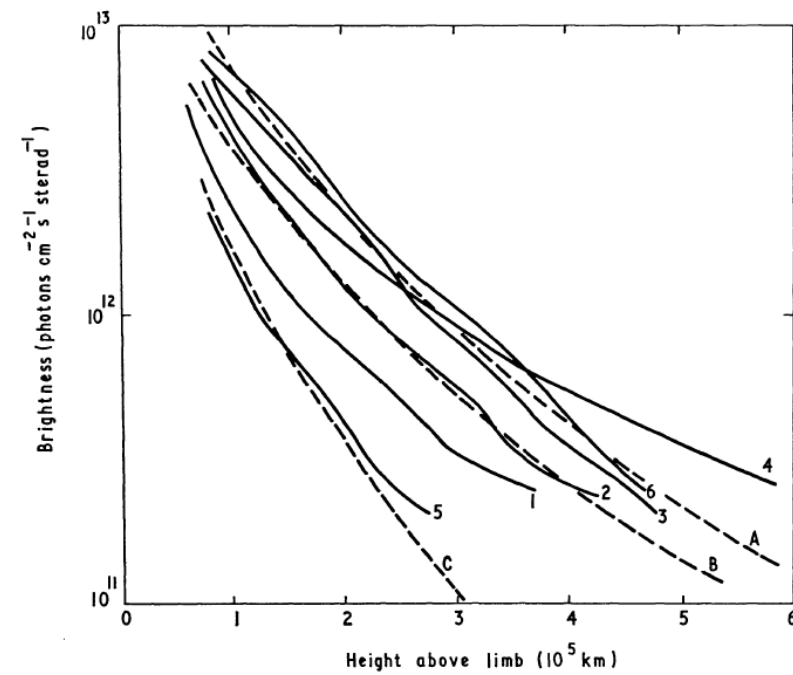


Fig. 5. Radial brightness variation of the Lyman  $\alpha$  corona. Curves 1, 2, and 3 represent observations at solar N, W, and E, 4 is at an intense white light streamer, 5 is a quiet cool region and 6 is at a coronal condensation.

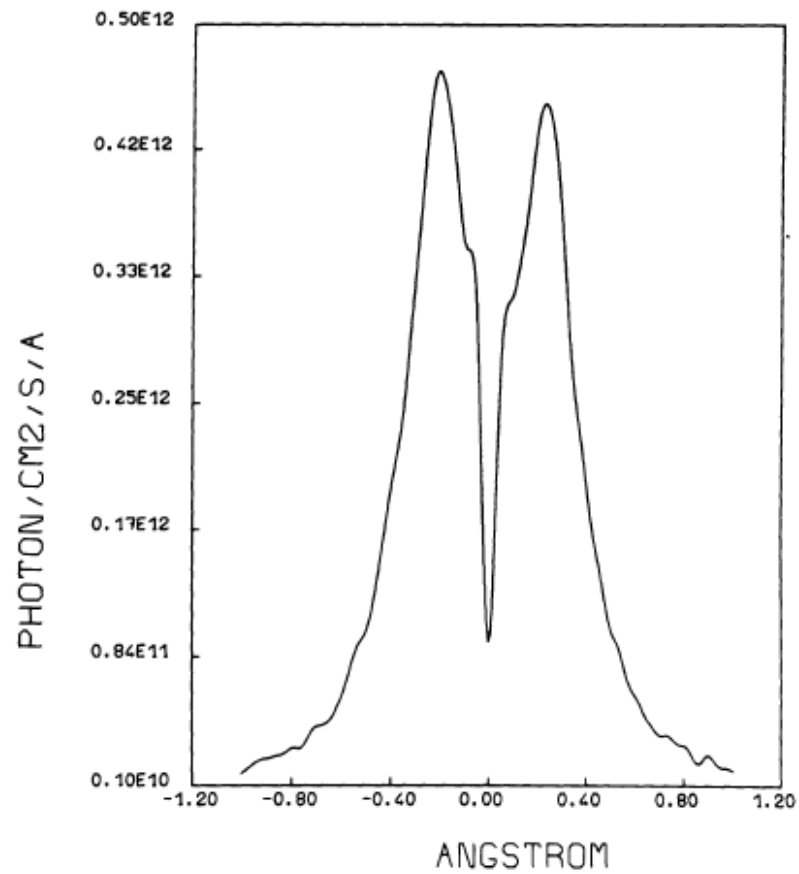
1971-1972

-----

Needs of a grazing incidence solar telescope-spectrometer

(--> GRIST, CHASE)

Shröter,E., Jordan,C., Lemaire,P., Mehltreter,P., Kuperus,M., Shapland,D., (1972)  
Views of the ESRO-PASOL Goup on Solar Astronomy , in The Post-APPOLLO Programme,  
ESRO/PA/R 100



Quiet Sun (1976-1977) composite

Ly $\alpha$  irradiance profile with geocoronal  
absorption line)

OSO 8 /LPSP

(weighted average over disc center and  
limb )

Lemaire et al (1978), ApJ 223,L55

1982 -1985

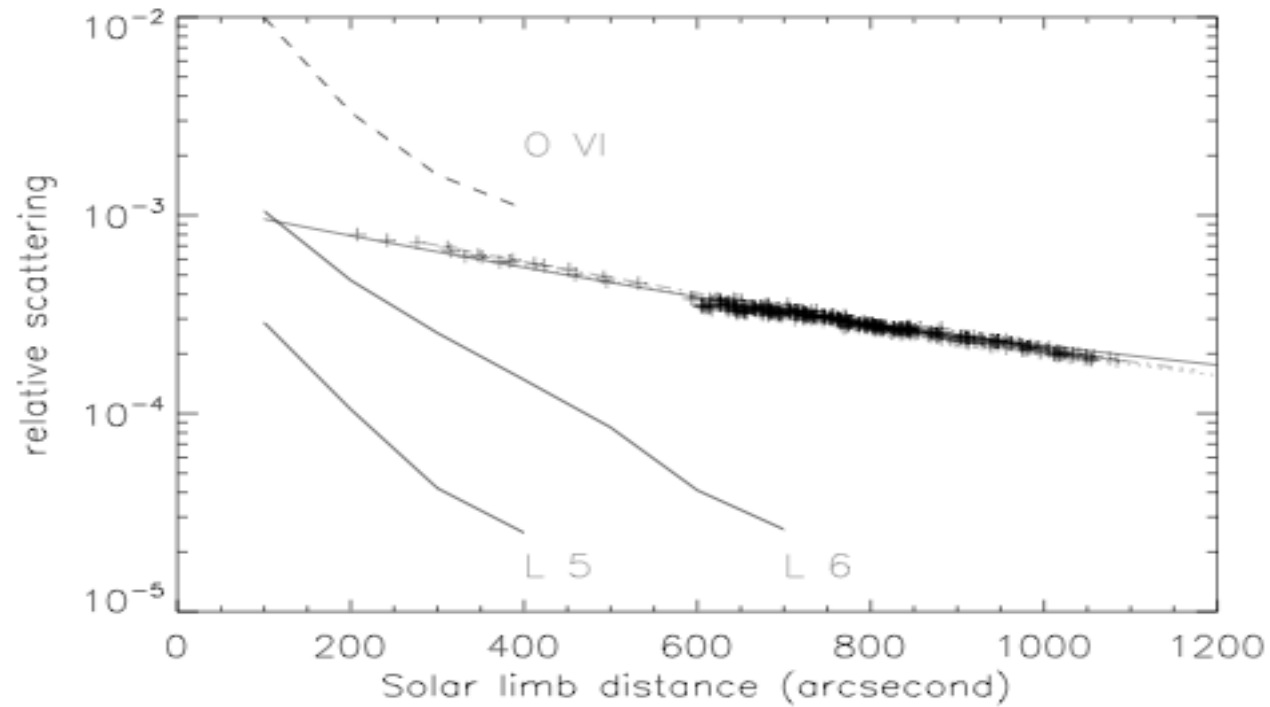
-

SOHO assessment study (1983-1984)  
(future of LPSP?, towards a new institute?)

Alan is candidate for LPSP (LPSP-IAS) directorship (1984)

Alan is director of LPSP/IAS (1985)

1996 - 2009



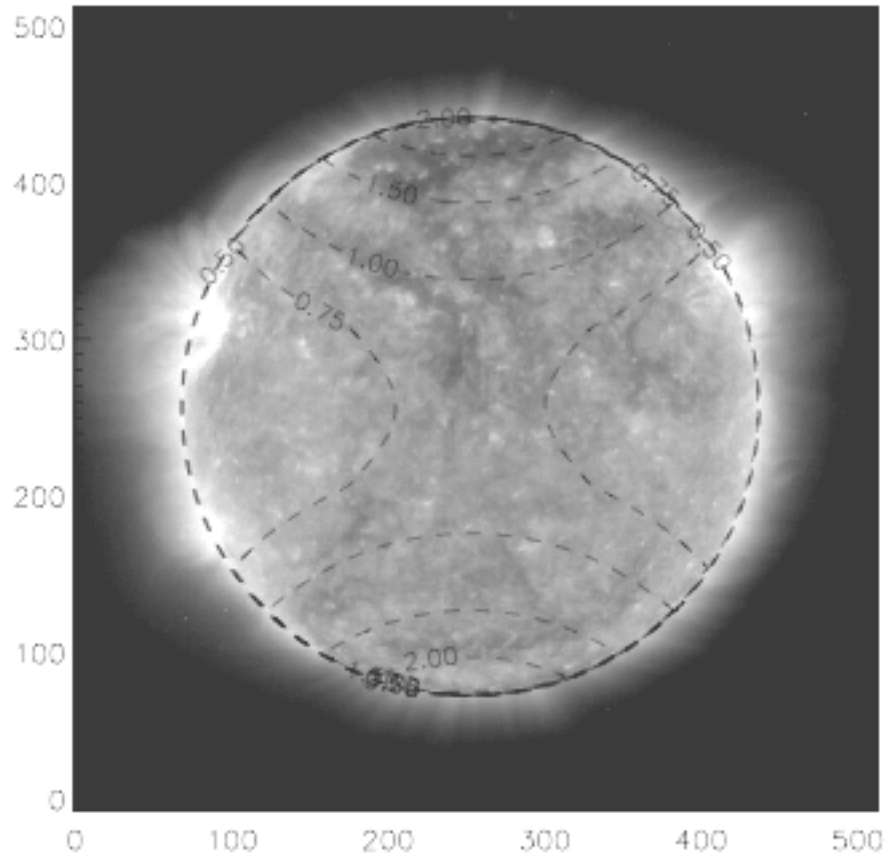
L 5, L 6 - (Ly  $\alpha$ , 1970 eclipse ) Gabriel (1971)

O VI - Plume , ( Gabriel et al. ,2003, ApJ, 589, 623)

+++ - SUMER scattering at 121.6 nm ( 1996-2009 combined data ),  
fitted with the convolution between the observed PSF (Saha et al., 1996,  
Applied Opt. 35,1742) and the solar disc

1996 - 2009

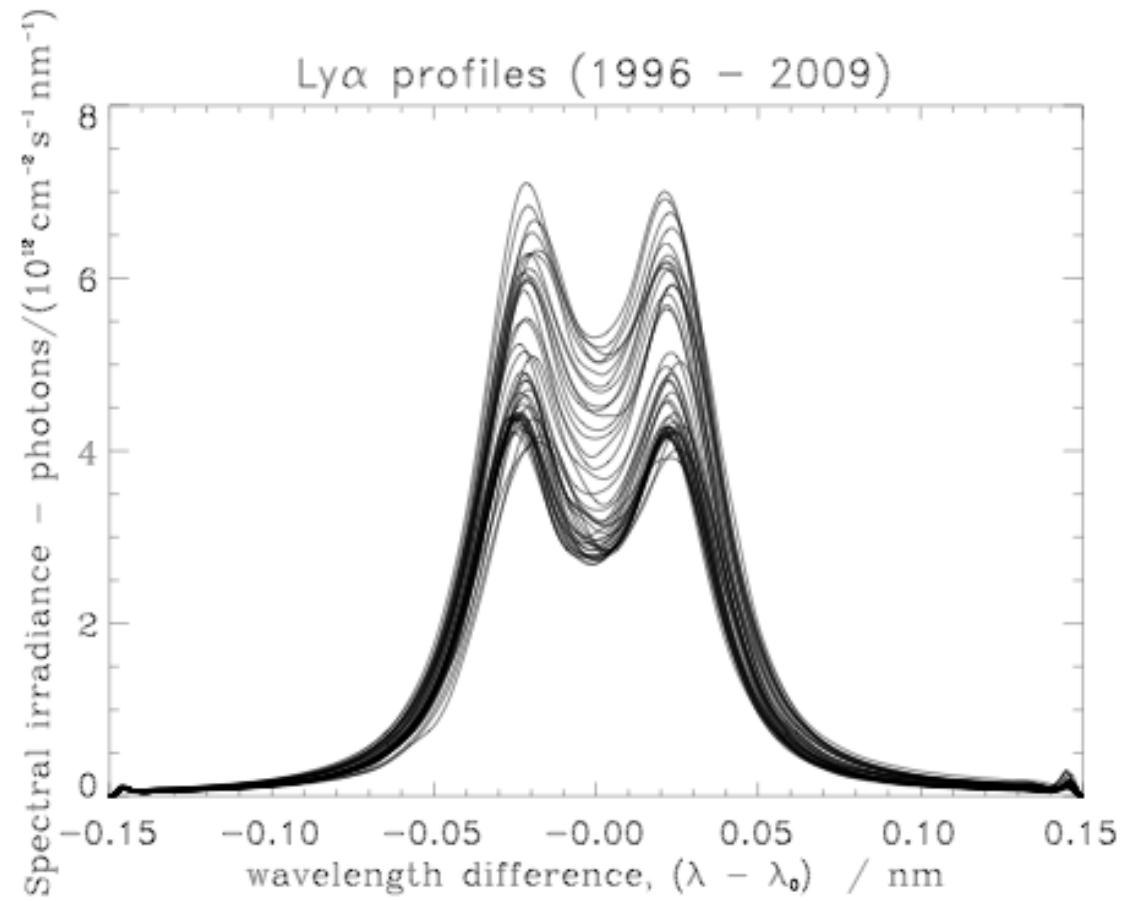
slit



slit

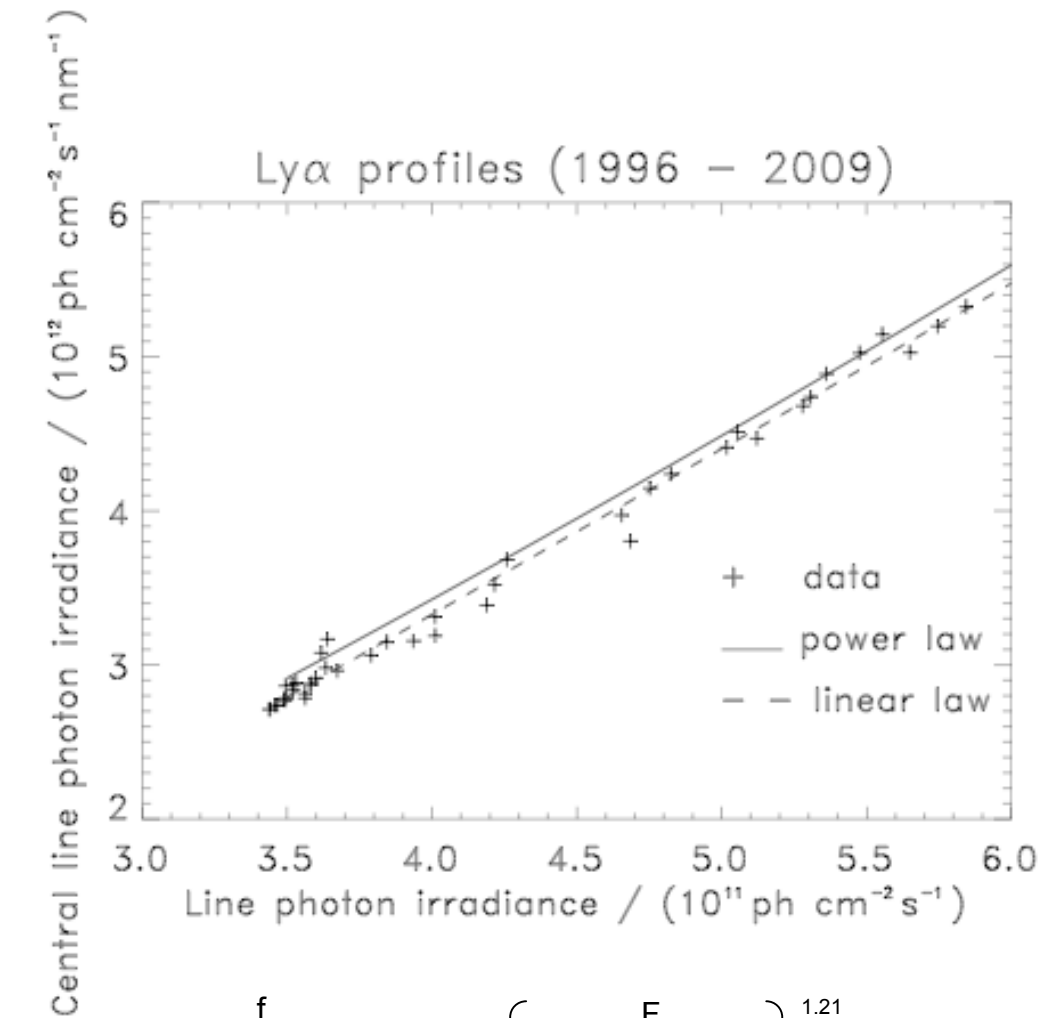
Two slit positions ( $\pm 1700$  arcsec)

Disc contributions to scattering



Deconvolved Lyman profiles acquired through solar cycle 23 (1996 -2009)  
Calibration using data from UARS/SOLSTICE and TIMED/SEE (Woods et al)





—  $\frac{f}{10^{12} \text{ s}^{-1} \text{ cm}^{-2} \text{ nm}^{-1}} = 0.64 \left( \frac{F}{10^{11} \text{ s}^{-1} \text{ cm}^{-2}} \right)^{1.21} \pm 0.08$  Emerich et al (2005)

- - -  $\frac{f}{10^{12} \text{ s}^{-1} \text{ cm}^{-2} \text{ nm}^{-1}} = 0.969 + 1.074 \left( \frac{F}{10^{11} \text{ s}^{-1} \text{ cm}^{-2}} \right) \pm 0.07$  This work

**1971- 2013**

-----

In 40 years, our understanding of the solar machinery has a lot increased

and

Alan is one of the main contributors to the new vision of the Sun