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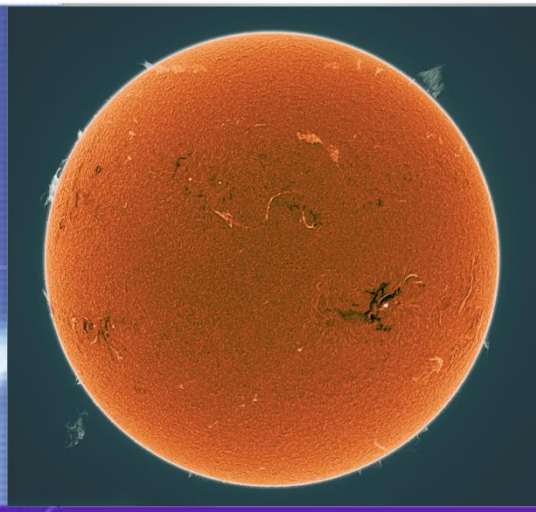
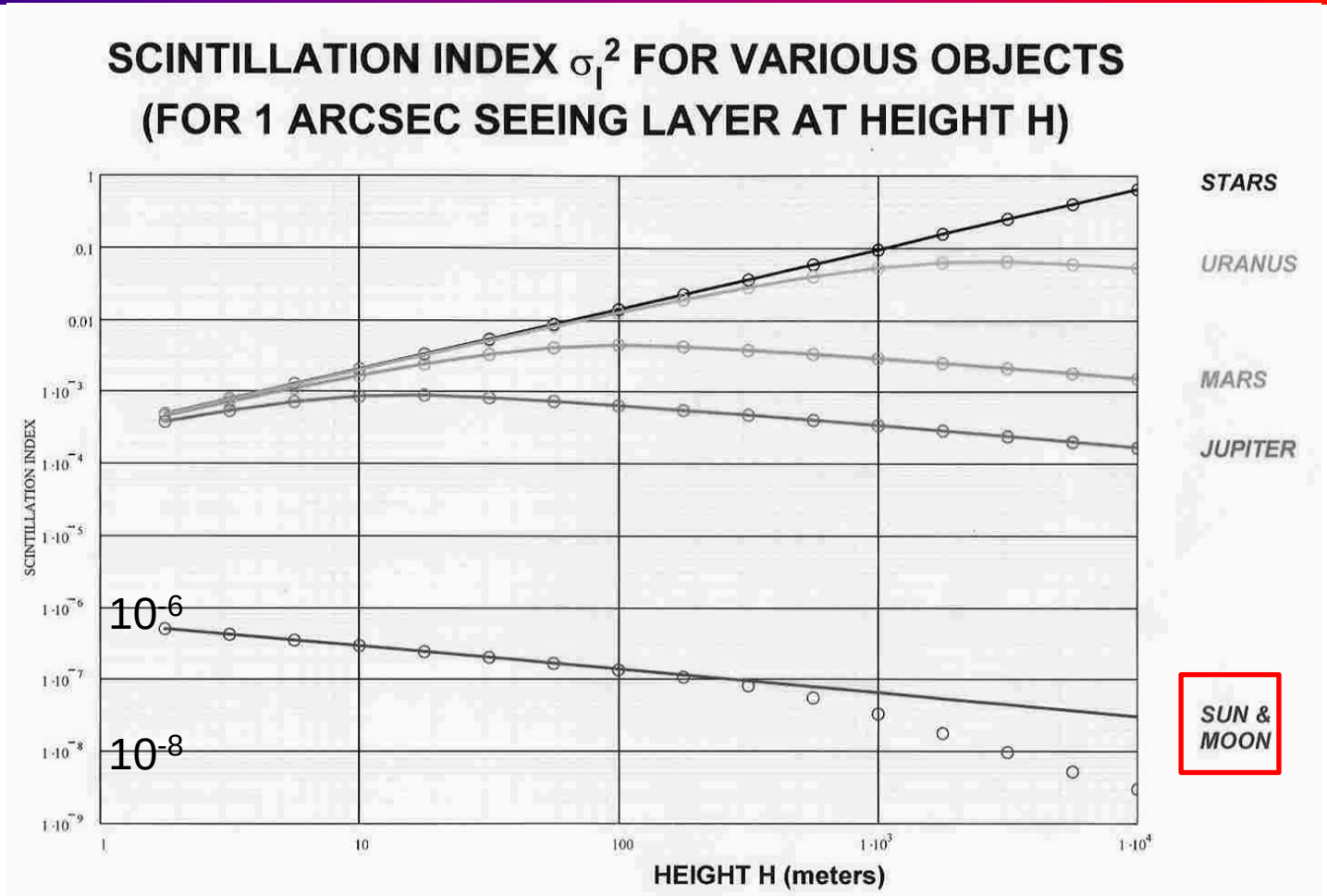
Solar Scintillation Monitor

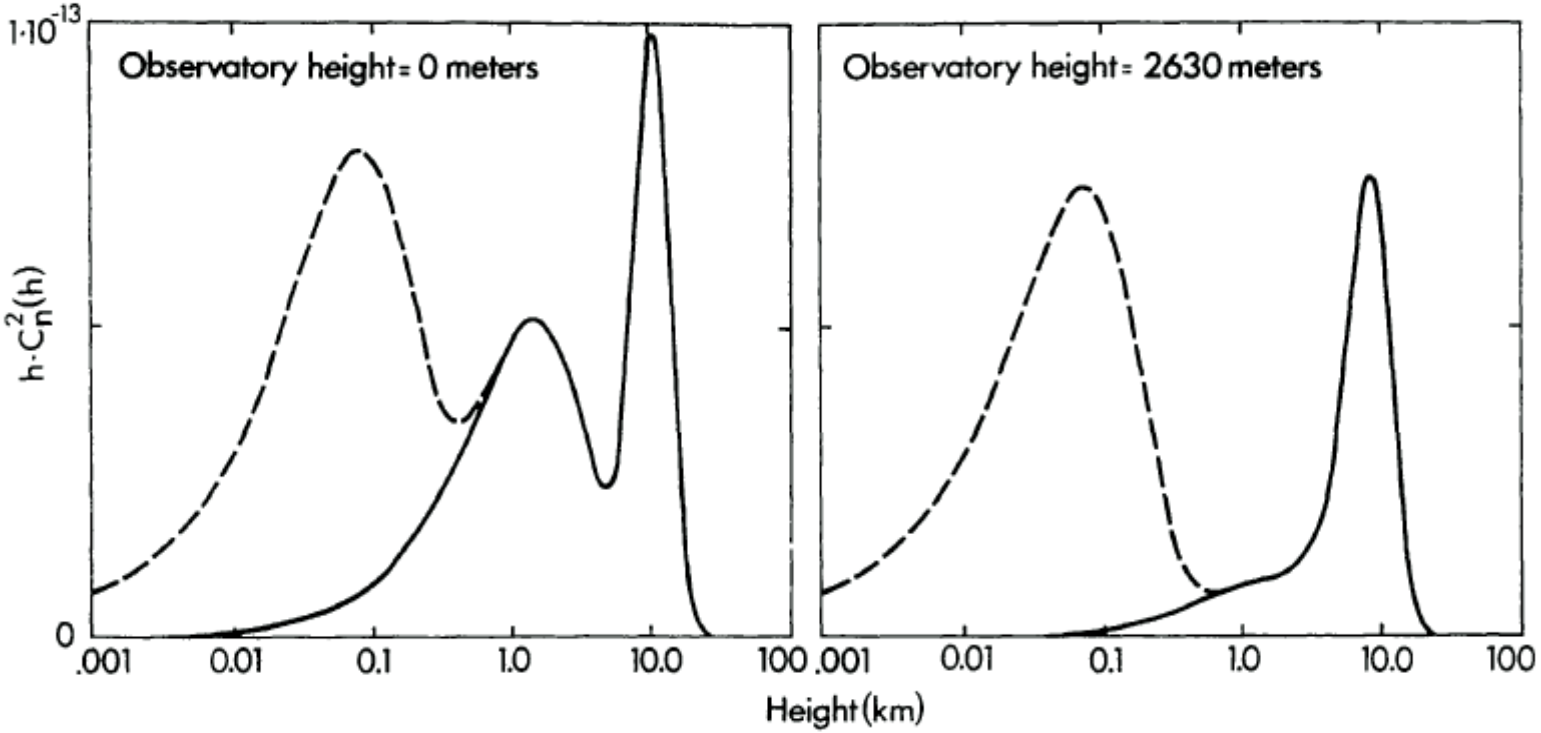


Frédéric Jabet

La scintillation dépend de l'objet et de la hauteur

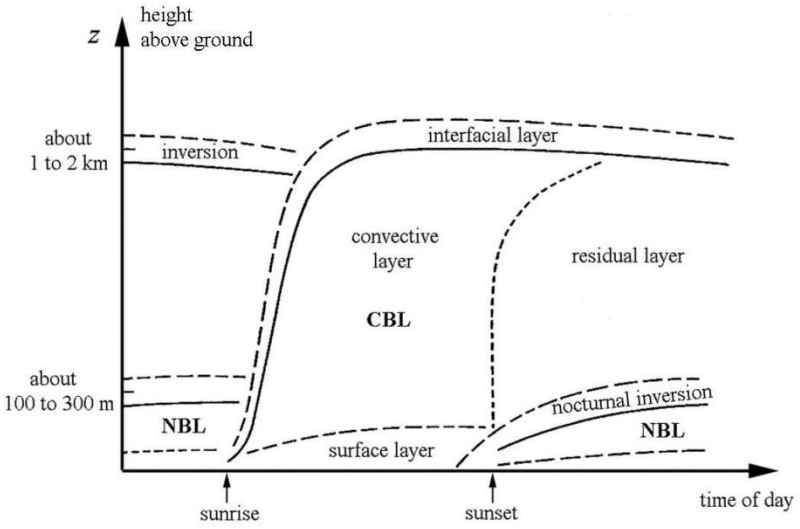


Rappel sur la distribution de la turbulence C^2_n



Dotted line is daytime. Beckers, 1993

Contributeurs de la turbulence diurne



Garratt, 1992

Origine	Importance	Altitude	Impact sur la scintillation
Jetstreams	+	7-12km	$\approx 10^{-8}$
Couche convective	++	<1km	$\approx 5.10^{-7}$
Couche de surface	+++	<100m	$\approx 10^{-6}$

SSM

- Analyser la scintillation permet de retrouver la valeur de seeing
- Analyse rapide des variations du millionième au 100 millionième : plus sensible à la turbulence de sol
- 1400 mesures via une photodiode 2 fois par seconde
- Montage analogique pour préserver le SNR
- Version à photodiode embarquée ou externe

Positionnement de la sonde

- Au plus près de la pupille d'entrée
- Où est la pupille ? Par exemple sur un newton ouvert ?

SSM : 3 modes d'utilisation

- Nomade pour analyse de site : sur batterie et avec l'écran interne
- Analyse temporelle : avec PC et logiciel dédié
- Mode automatique : avec Genika Astro pour un déclenchement automatique

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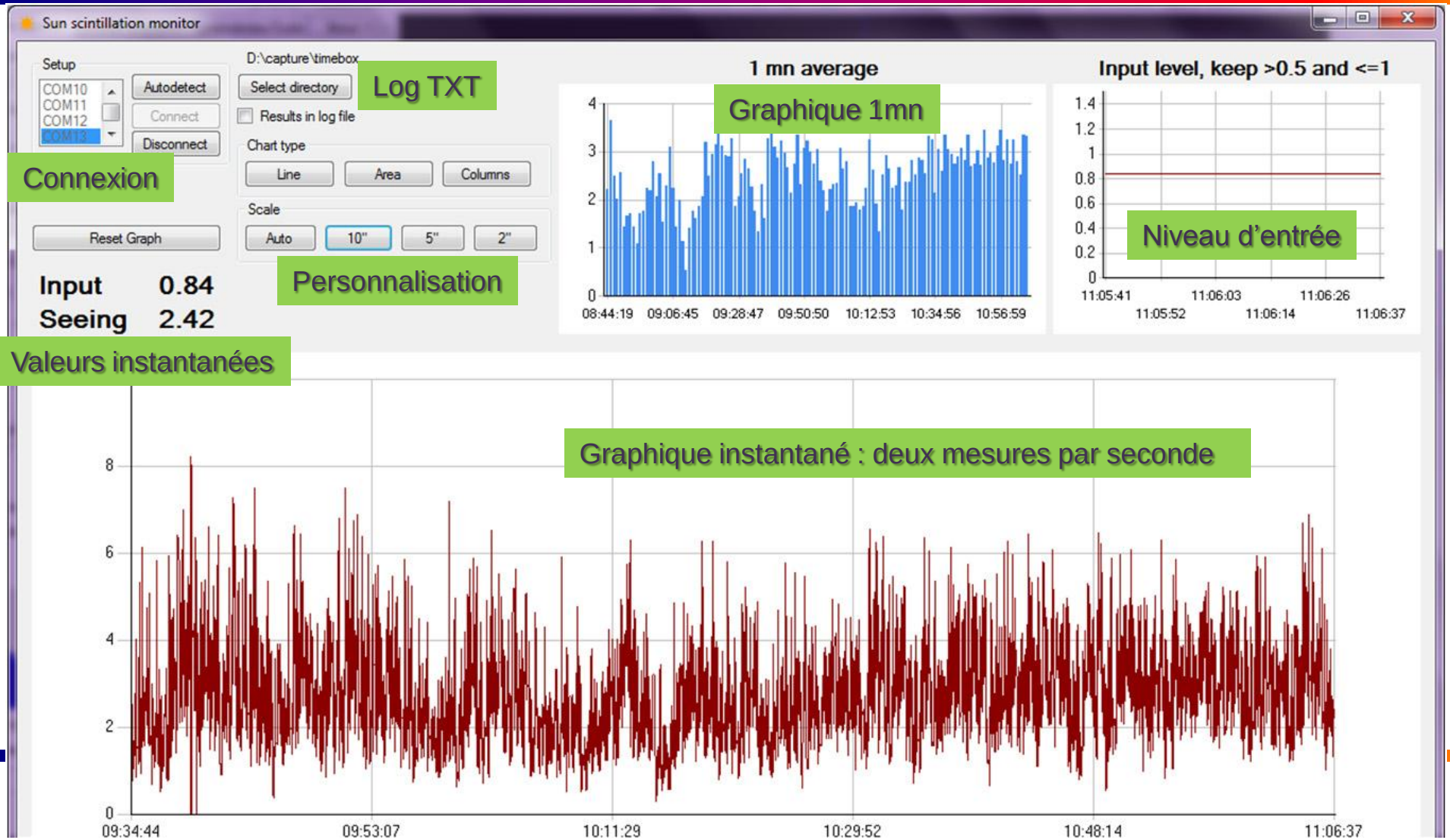
Logiciel dédié/fenêtre SSM de Genika



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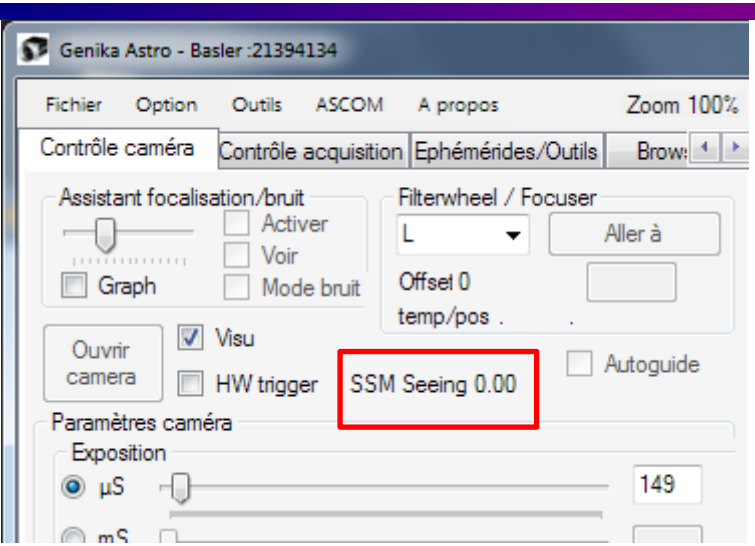
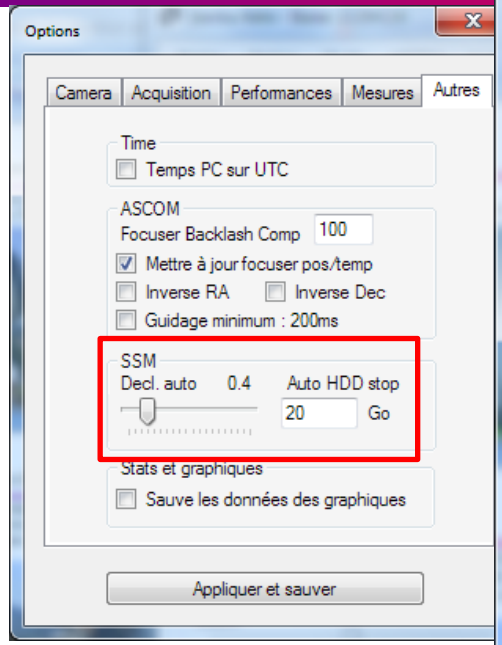
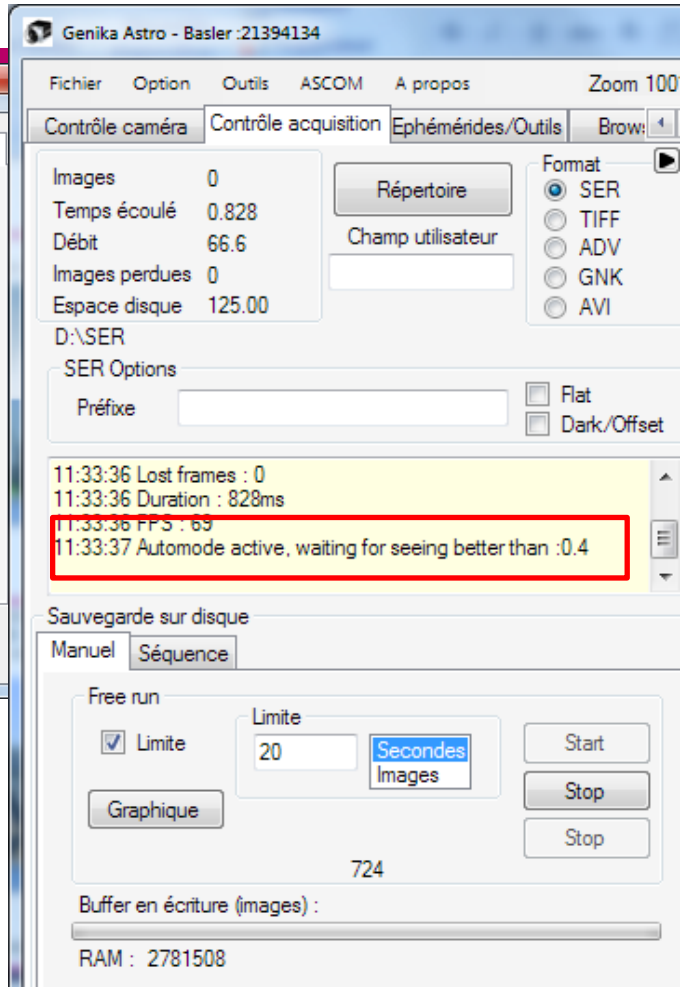
Mode automatique 1/3 : configuration







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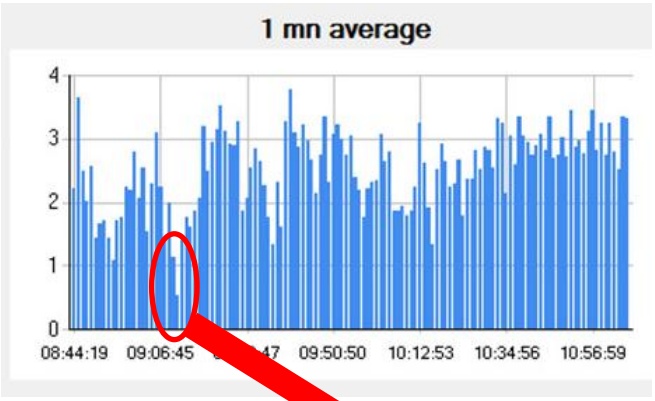
Mode automatique 2/3 : log

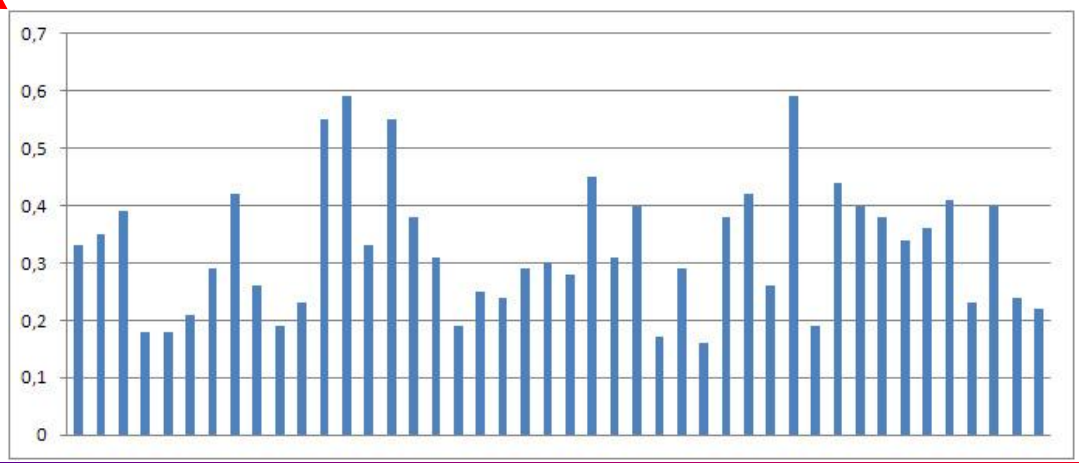
```
************************  GENIKA ASTRO CAPTURE LOG FILE
**************************************

Genika Astro 64 bits release : 2.9.1.1 Mode DirectX
Filestream write mode
FIFO writing mode

Observer : Jabet

D:\capture\Soleil 4 Juin\2015-06-04_T_09-34-15-0835_L.txt

Camera manufacturer : Basler
Camera Model : acA1920-155um

Active filter : L

Number of images : 2900
Part of a sequence : No
Acquisition Length in mS: 20003
Mean FPS : 144.9783
Lost frames : 218

Start Time local time : 6/4/2015 9:34:15 AM UTC time : 6/4/2015 7:34:15
AM
End Time local time   : 6/4/2015 9:34:44 AM UTC time : 6/4/2015 7:34:44
AM
SER file mid acquisition time UTC (Winjupos hh:mm.mm) : 2015/06/04
07:34.50
Auto acquisition mode by SSM, trigger threshold was : 0.4
SSM Connected, average seeing over acquisition was : 00.36

User field :

---------------------- Ephemeris data
------------------------------------------------------------
Axis : Geocenter, planetary theory : INPOP10, J2000 epoch
Crédit : Institut de Mécanique Céleste, 77, avenue Denfert-Rochereau
```

```
Température IR disponible : 0
------------------------ SSM Seeing index
------------------------------------------------------------
08:54:04.087 = 0.31
08:54:04.089 = 0.43
08:54:04.717 = 0.56
08:54:05.181 = 0.87
08:54:05.736 = 1.32
08:54:06.282 = 2.01
08:54:06.839 = 0.56
08:54:07.386 = 0.32
08:54:07.941 = 0.35
08:54:08.496 = 0.45
08:54:09.041 = 0.78
08:54:09.585 = 0.90
08:54:10.151 = 0.57
08:54:10.690 = 0.66
08:54:11.244 = 0.56
08:54:11.834 = 0.47
08:54:12.340 = 0.50
08:54:12.892 = 0.50
08:54:13.445 = 0.32
08:54:13.991 = 0.37
08:54:14.554 = 0.52
08:54:15.094 = 0.61
08:54:15.642 = 0.47
08:54:16.199 = 0.42
08:54:16.744 = 0.63
08:54:17.295 = 0.84
08:54:17.847 = 0.71
08:54:18.405 = 0.82
08:54:18.944 = 0.63
08:54:19.504 = 0.55
08:54:20.046 = 0.46
08:54:20.637 = 0.60
08:54:21.147 = 0.61
08:54:21.705 = 0.68
08:54:22.250 = 0.89
08:54:22.803 = 1.10
08:54:23.351 = 1.22
08:54:23.901 = 1.21

************************  END OF FILE **********
```

Mode automatique 3/3 : trouver la fenêtre de tir !



Seeing médiocre, sauf peut être… ?




```
09:10:21.211 = 0.33
09:10:21.211 = 0.35
09:10:21.213 = 0.39
09:10:21.213 = 0.18
09:10:21.213 = 0.18
09:10:21.213 = 0.21
09:10:21.213 = 0.29
09:10:21.240 = 0.42
09:10:21.790 = 0.26
09:10:22.429 = 0.19
09:10:22.891 = 0.23
09:10:23.447 = 0.55
09:10:23.999 = 0.59
09:10:24.551 = 0.33
09:10:25.104 = 0.55
09:10:25.675 = 0.38
09:10:26.195 = 0.31
09:10:26.748 = 0.19
09:10:27.338 = 0.25
09:10:27.853 = 0.24
09:10:28.396 = 0.29
09:10:28.943 = 0.30
09:10:29.495 = 0.28
09:10:30.045 = 0.45
09:10:30.599 = 0.31
09:10:31.158 = 0.40
09:10:31.728 = 0.17
09:10:32.246 = 0.29
09:10:32.791 = 0.16
09:10:33.340 = 0.38
09:10:33.891 = 0.42
09:10:34.439 = 0.26
09:10:34.998 = 0.59
09:10:35.545 = 0.19
09:10:36.089 = 0.44
09:10:36.648 = 0.40
09:10:37.191 = 0.38
09:10:37.753 = 0.34
09:10:38.291 = 0.36
09:10:38.865 = 0.41
09:10:39.404 = 0.23
09:10:39.998 = 0.40
09:10:40.493 = 0.24
09:10:41.056 = 0.22
```

Merci SSM !

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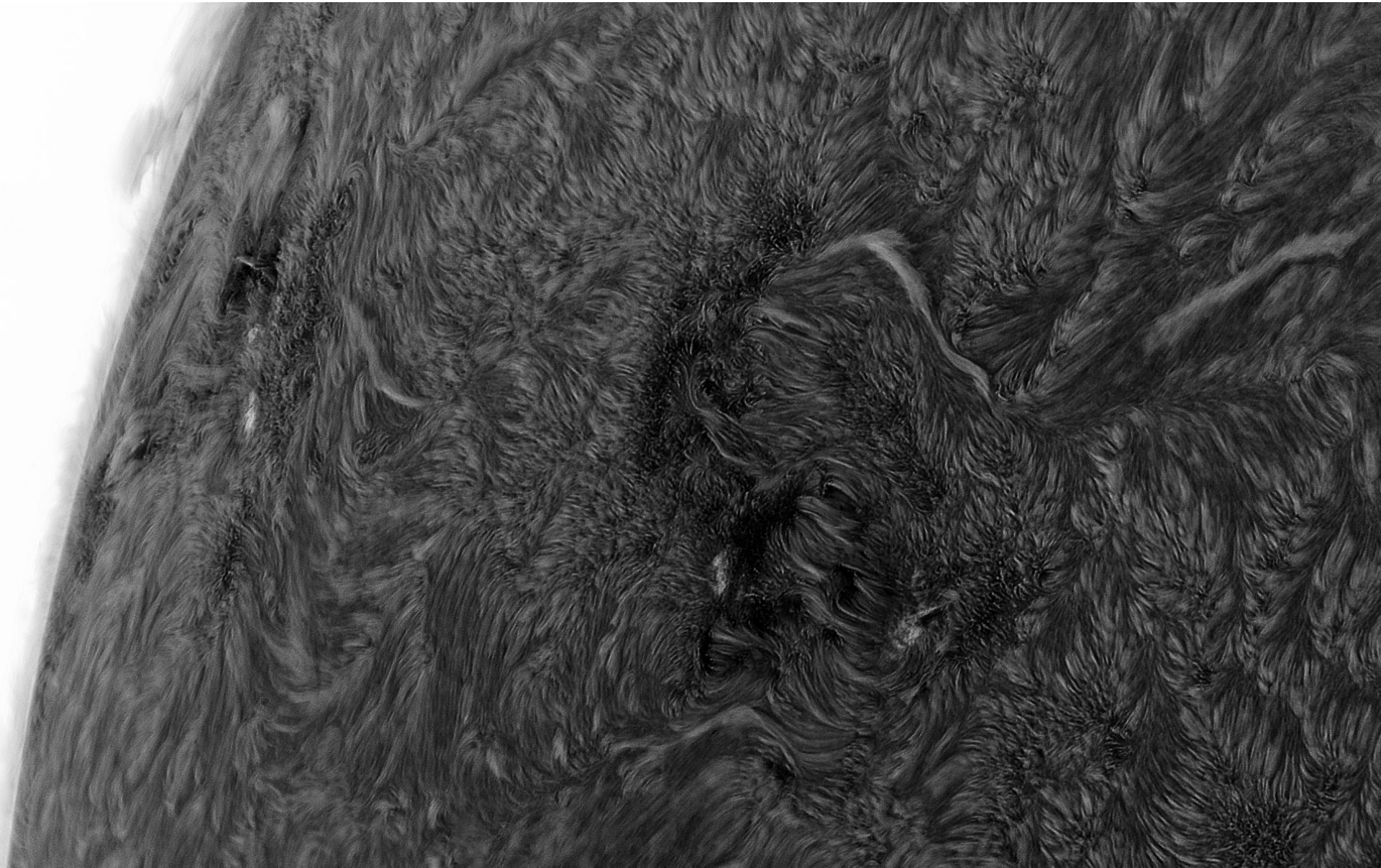

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