DAG: Astronomik Görüş Ölçümleri (Seeing) ve Sistemler

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01 – 02 Şubat 2019
AstroMeteo Çalıştayı

Bu verileri almamızda katkısı olan çalışma ekibi

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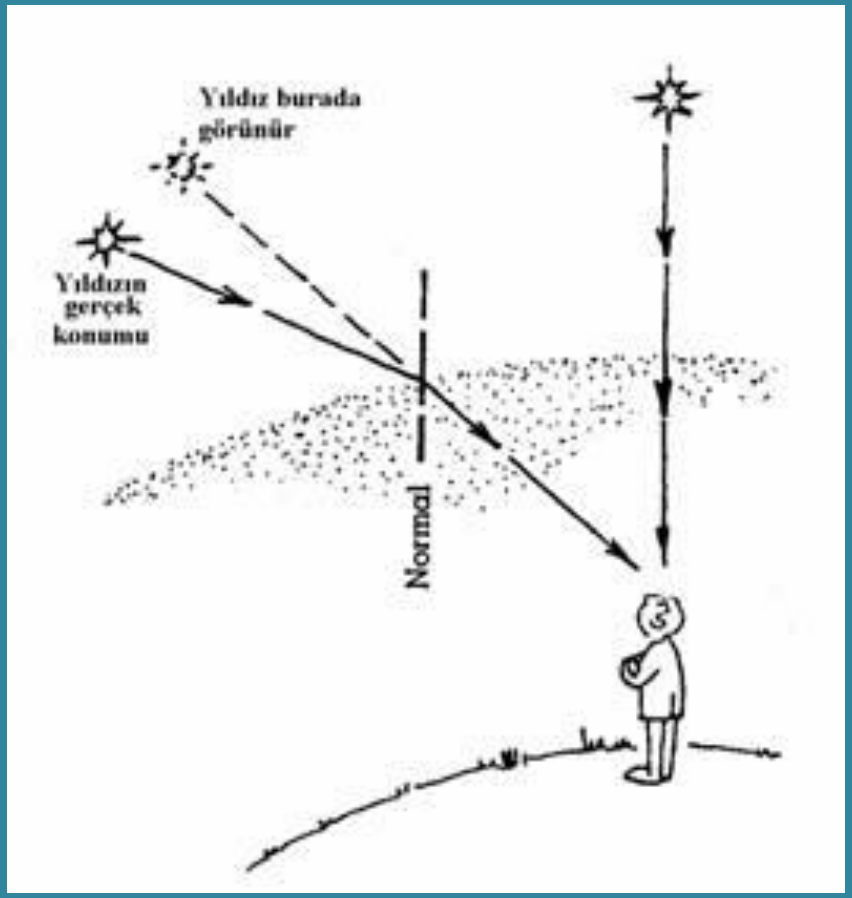
ATMOSFERİK GÖRÜŞ



Sıcaklık

Yoğunluk

θmin = 206265 (λ/d)

ATMOSFERİK GÖRÜŞ SİSTEMLERİ

- SBIG (Santa Barbara Instrument Group) SEEING MONITOR
- ALCOR - SYSTEM CYCLOPE SEEING MONITOR
- MANUAL DIMM

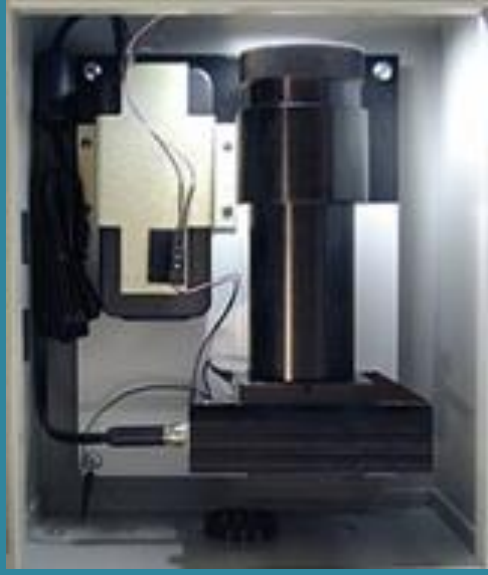
METEOROLOJİK SİSTEMLER

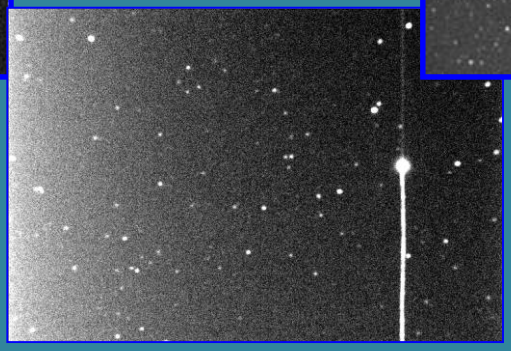
- ALCOR (LSI) – 5 dakika
- VAISALA / DAVIS – 1 dakika / 5 dakika

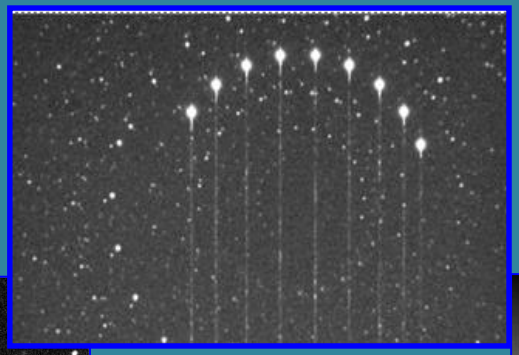
(Sıcaklık, Nem, Rüzgar hızı /yönü, Basınç)

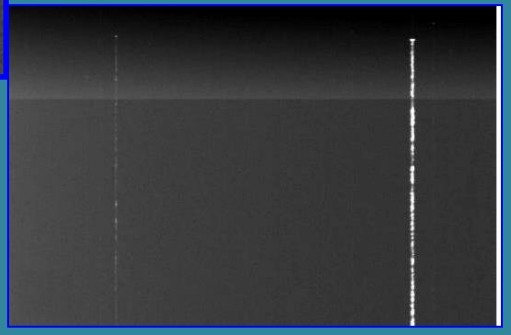
SBIG SM

CCD: Kodak KAF – 0402ME
Çap: 150 mm
Odak oranı: f/5.3
CCD boyutu: 6.9 x 4.3 mm
Piksel: 765 x 510 piksel
Yaz – kış ayarı var
Poz süresi 5 ms









SBIG SM

#Date	JD	FWHM	X_coor	Y_coor	Exptime	CCD_tmp	Mag	MErr
2013-11-18T18:50:38.000	2456615.28516	5.63	393.64394505	456.878497696	1.0	1.45708754667	-15.5851	0.0002
2013-11-18T18:50:43.000	2456615.28522	8.19	393.469488171	457.087120096	1.0	1.45708754667	-15.6539	0.0002
2013-11-18T18:50:47.000	2456615.28527	6.75	391.65869395	457.795327474	1.0	1.45708754667	-15.6051	0.0002
2013-11-18T18:50:51.000	2456615.28531	9.93	391.586885903	460.239341282	1.0	1.45708754667	-15.6532	0.0003

$$R_0 = \lambda\,[(c^2/0.179)*((28 / \lambda)^{0.33}]^{(-0.6)}$$

$$c = 0.98 * \lambda / (R_0 * sabit)$$

$$Seeing = c * (1 / [\cos(pi * (90 - enlem) / 180)]^{(-0.6)}$$

Ro : Fried Parametresi

SBIG SM

SBIG - SM	
2013 - 18 Kasım	
Mod	1.57
ModSayi	4
Minimum	1.03
Average <3	1.86
Median <3	1.77
Average <5	2.03
Median <5	2.10
ToplamData	113
0-1 DataSayisi	0
1-2 DataSayisi	52
2-3 DataSayisi	42
3-4 DataSayisi	12
4-5 DataSayisi	0
Toplam <3	94
3 < Toplam <5	12
Toplam <5	106
< 3 %	% 83
(<3 & <5) %	% 11
< 5 %	% 94

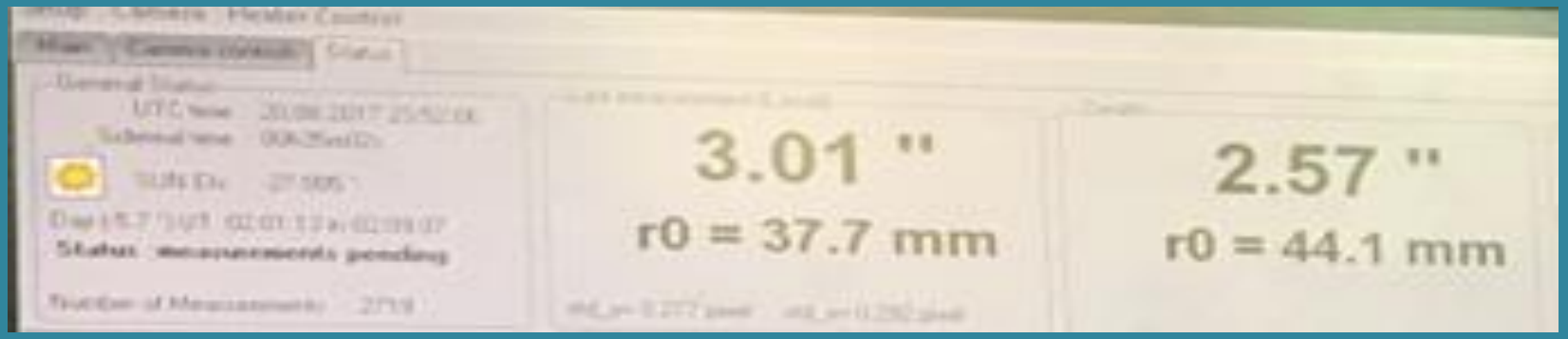
SBIG SM

Yıl	2013	2013	2014	2016	2016	2017
Ay	11	12	1	10	11	7
N	1	4	19	3	4	7
Average <3	1.86	1.76	2.02	1.03	1.88	1.10
Median <3	1.77	1.71	1.97	0.88	1.82	0.99
Average <5	2.03	2.29	2.45	1.08	2.26	1.36
Median <5	2.10	2.10	2.04	0.56	2.08	1.04
< 3 %	% 83	% 63	% 59	% 97	% 94	% 89
(<3 & <5) %	% 11	% 24	% 26	% 2	% 6	% 11

Yıl	2017	2017	2017	2018	2018
Ay	8	9	10	2	3
N	22	24	4	14	14
Average <3	1.62	1.37	1.61	1.90	2.13
Median <3	1.51	1.23	1.55	1.83	2.10
Average <5	2.13	1.73	2.13	2.22	2.56
Median <5	1.86	1.49	2.09	1.84	2.15
< 3 %	% 64	% 78	% 68	% 74	% 70
(<3 & <5) %	% 18	% 14	% 22	% 17	% 26

ALCOR SM

FoV: 3.6° x 2.5°
Filter: 550 nm
Örneklem: 50 Hz
Otomatik seeing *
Yaz – kış ayarı yok




```
1  Rms X motion (pixels) : 0.271
2  Rms Y motion (pixels) : 0.247
3  X seeing (arcsec)     : 2.835
4  Y seeing (arcsec)     : 2.531
5  Total seeing (arcsec) : 2.683
```

ALCOR - SM	
2018 - 17 Mart	
Mod	2.14
ModSayi	5
Minimum	0.49
Average <3	2.20
Median <3	2.20
Average <5	2.97
Median <5	2.81
ToplamData	6479
0-1 DataSayisi	1
1-2 DataSayisi	423
2-3 DataSayisi	780
3-4 DataSayisi	531
4-5 DataSayisi	442
Toplam <3	1204
3 < Toplam <5	973
Toplam <5	2177
< 3 %	% 19
(<3 & <5) %	% 15
< 5 %	% 34

ALCOR SM

Yıl	2017	2017	2017	2017
Ay	8	9	10	11
N	3	7	9	9
Average <3	1.92	2.08	2.16	2.29
Median <3	1.85	2.06	2.17	2.32
Average <5	2.66	2.86	3.08	3.39
Median <5	2.51	2.70	3.01	3.35
< 3 %	% 32	% 43	% 47	% 44
(<3 & <5) %	% 18	% 33	% 40	% 31

Yıl	2017	2018	2018	2018
Ay	12	1	2	3
N	11	9	12	1
Average <3	2.27	2.38	2.30	2.20
Median <3	2.33	2.43	2.37	2.20
Average <5	3.15	3.42	3.48	2.97
Median <5	3.15	3.46	3.51	2.81
< 3 %	% 33	% 15	% 32	% 19
(<3 & <5) %	% 12	% 15	% 15	% 15

DIMM

$$S = d / D$$

d: 203 mm D: 100 mm

Teleskop: Meade LX200 12 inç

Kamera: Astrovid Stellacam III

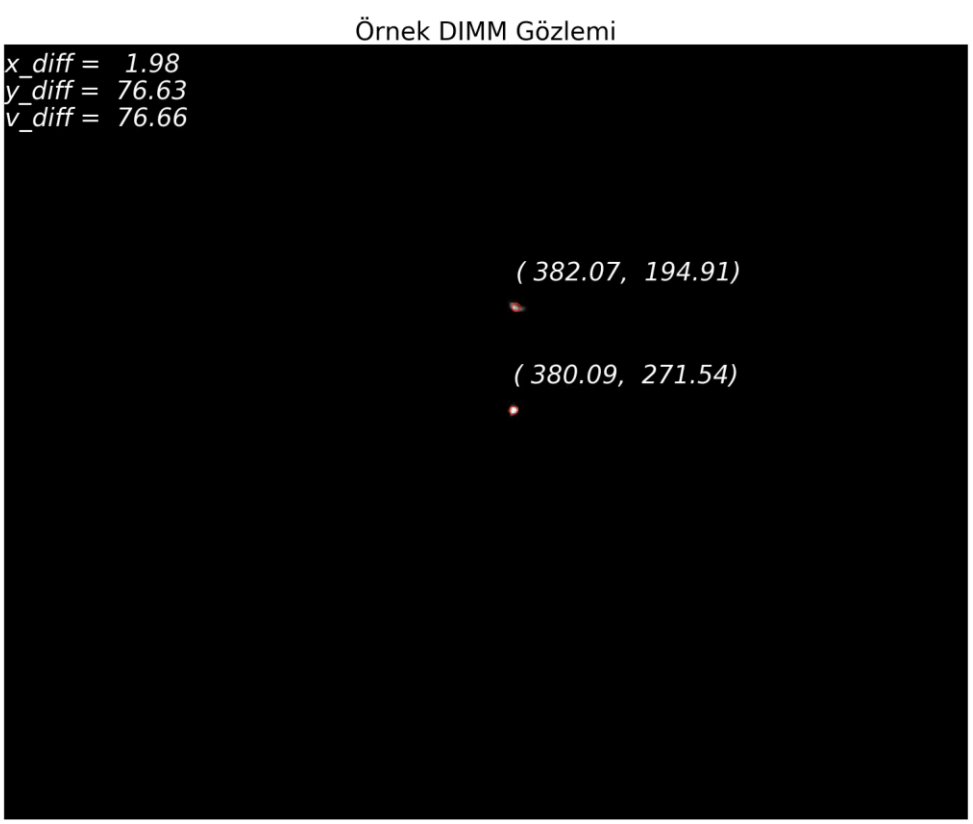
Video yakalama kartı

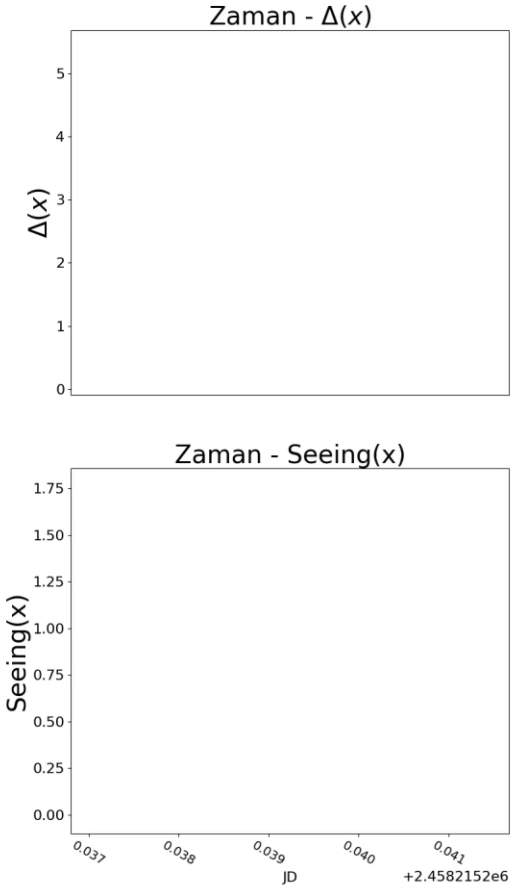
Dikkat Edilmesi Gerekenler

- Teleskop Çapı > 20 cm
- D - d arasında
- S > 2,5
- Poz süresi << V / Teleskop çapı
- N – fazla olmalı

DIMM Sisteminin Avantajları

- Teleskop takip hataları otomatik çıkarılır.
- Rüzgarın etkisi yoktur.
- Amatör alıcılarla kolay uygulanabilir.
- DIMM aynı değişkenin iki istatiksel tahminini verir.
- Teleskopun optik kalitesi önemli değildir.


Örnek DIMM Gözlemi
x_diff = 1.98
y_diff = 76.63
v_diff = 76.66
(382.07, 194.91)
(380.09, 271.54)


Zaman - Δ(x)
Δ(x)
0
1
2
3
4
5
Zaman - Seeing(x)
Seeing(x)
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
0.037
0.038
0.039
0.040
0.041
JD
+2.4582152e6

DIMM

JD	Seeing_x	Seeing_x_err	Seeing_v	Seeing_v_err	fn	VD
2458423.30152	9.00	0.38	9.55	0.31	600	0.89
2458423.30178	13.17	0.15	14.95	0.12	600	0.79
2458423.30200	3.67	0.09	3.93	0.13	413	0.99
2458423.30360	11.26	0.42	11.52	0.41	600	0.80
2458423.30387	6.64	0.43	6.91	0.73	600	0.90
2458423.30414	18.08	0.10	13.31	0.30	600	0.77

DIMM

Yıl	2017	2017	2018	2018	2018
Ay	8	9	1	2	3
N	1	7	2	9	6
Minimum	1.04	0.34	0.88	0.31	0.36
Average <3	1.52	0.88	1.12	0.87	0.68
Median <3	1.35	0.88	1.07	0.85	0.65
Average <5	1.52	0.86	1.08	1.13	3.86
Median <5	1.35	0.86	1.07	1.08	3.99

Yıl	2018	2018	2018	2018	2018
Ay	4	5	6	7	8
N	10	7	3	9	8
Minimum	**0.21**	0.52	0.75	0.51	0.68
Average <3	1.15	0.95	1.46	1.56	1.56
Median <3	1.13	0.92	1.29	1.51	1.51
Average <5	1.15	0.93	1.71	2.02	1.93
Median <5	1.13	0.92	1.43	2.00	1.85

SBIG – ALCOR - DIMM

	ALCOR	SBIG	DIMM
Minimum	0.32	1.22	0.31
Average <3	2.03	1.99	1.09
Median <3	2.07	1.91	1.04
Average <5	2.44	2.27	1.1
Median <5	2.31	2.13	1.04
ToplamData	9505	3727	21036
0-1 DataSayisi	115	0	9417
1-2 DataSayisi	991	1625	11151
2-3 DataSayisi	1343	1228	426
3-4 DataSayisi	513	388	24
4-5 DataSayisi	253	165	0
Toplam <3	2449	2853	20994
3 < Toplam <5	766	553	24
Toplam <5	3215	3406	21018
< 3 %	% 26	% 77	% 99
(<3 & <5) %	% 8	% 15	% 0
< 5 %	% 34	% 91	% 99

20180223

N = 116

SBIG Seeing Monitor				
Minimum (seeing arcsec)	Average <3 (seeing arcsec)	Median <3	Average <5 (seeing arcsec)	Median <5
0.34	1.41	1.30	1.84	1.59

N = 61

ALCOR				
Minimum (seeing arcsec)	Average <3 (seeing arcsec)	Median <3	Average <5 (seeing arcsec)	Median <5
0.30	2.19	2.20	3.15	3.16

N = 63

Manual DIMM				
Minimum (seeing arcsec)	Average <3 (seeing arcsec)	Median <3	Average <5 (seeing arcsec)	Median <5
0.26	1.22	1.18	1.80	1.78

PLANLAR

- Sistemlerin kendi içinde kalibrasyonunu sağlamak

- Meteorolojik verilerle olan ilişkisini belirlemek

TEŞEKKÜRLER

SORULAR ?

01 – 02 Şubat 2019
AstroMeteo Çalıştayı