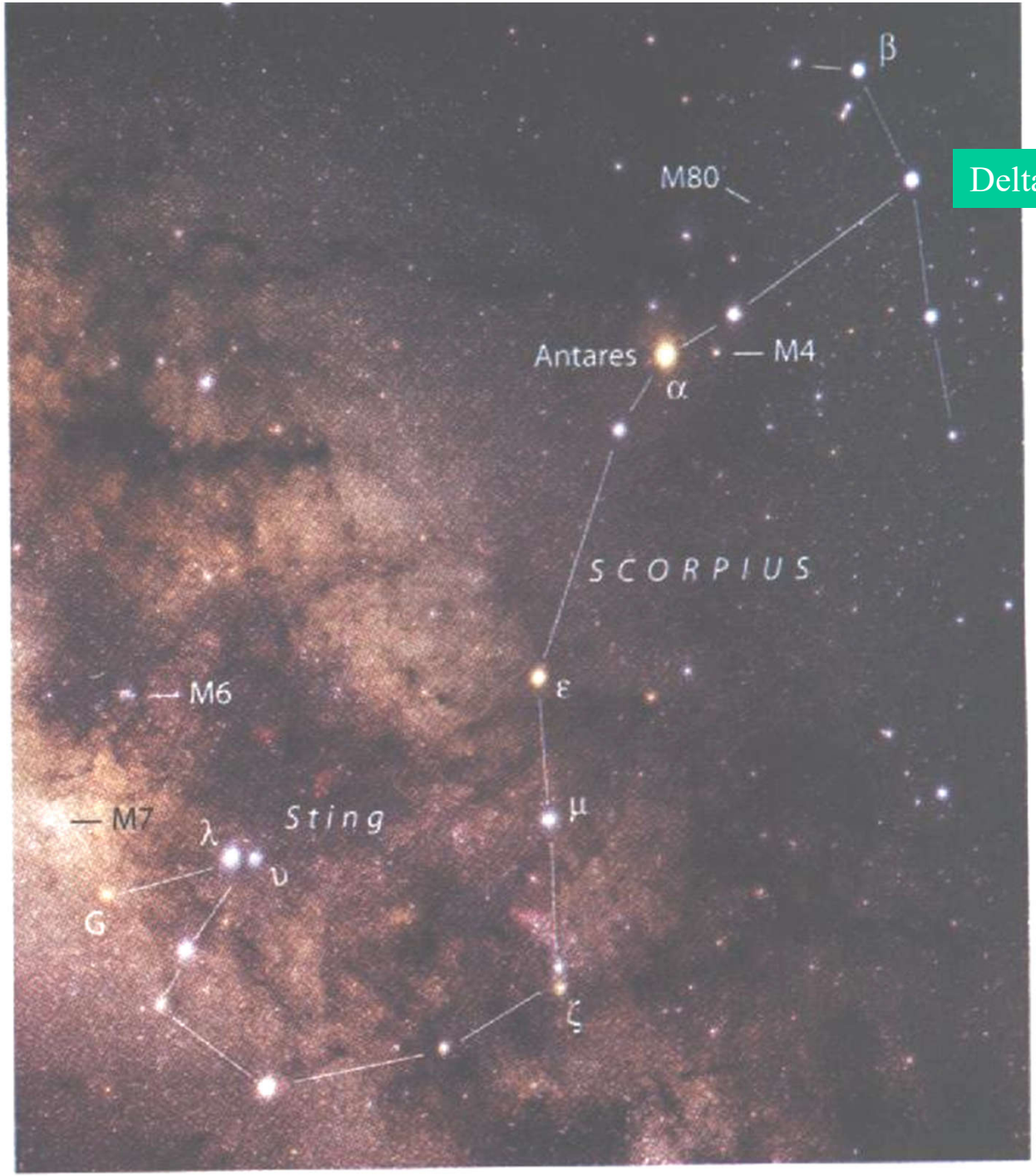
Delta Scorpii Variability 2000-2008

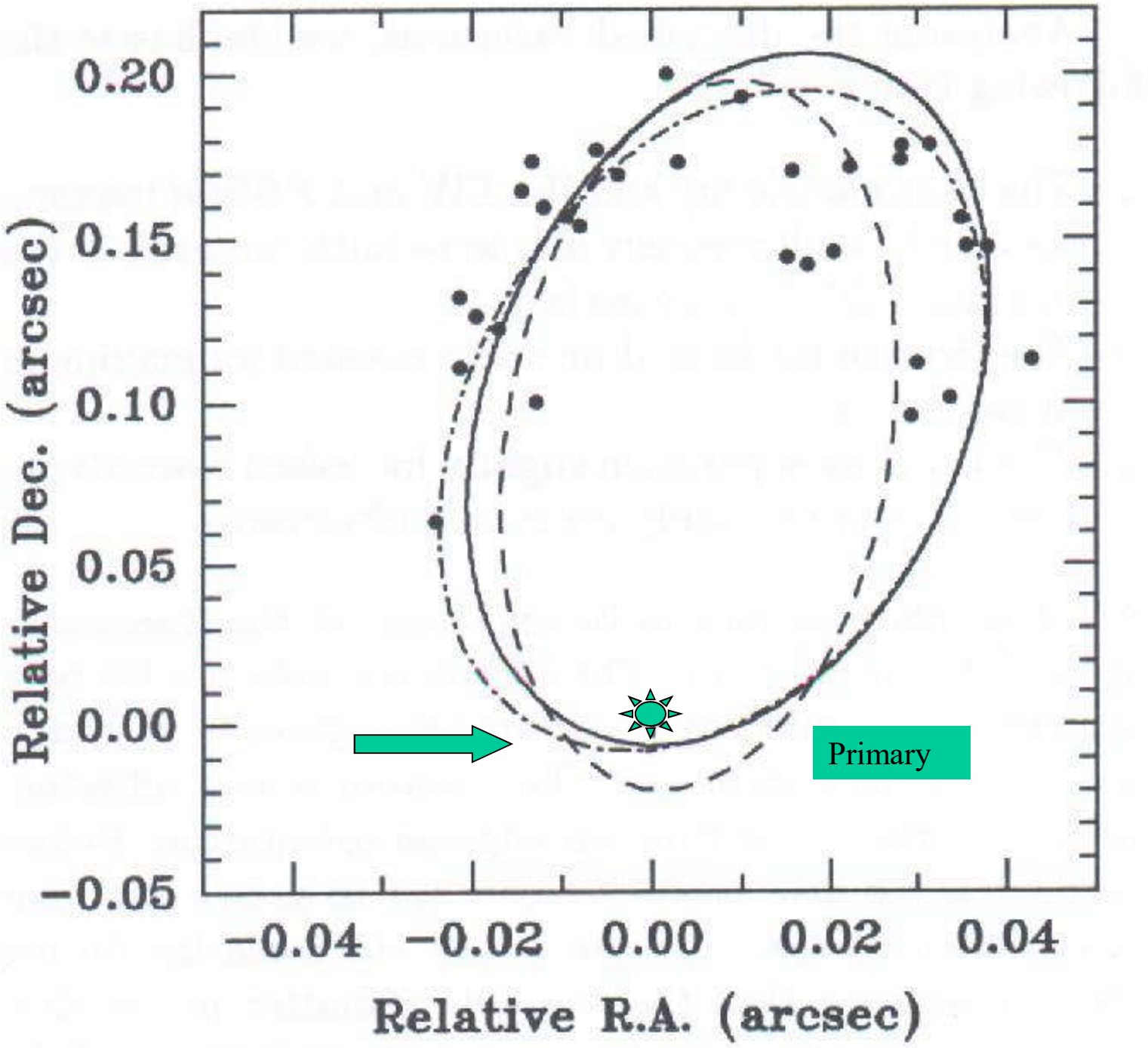
Brian Fraser

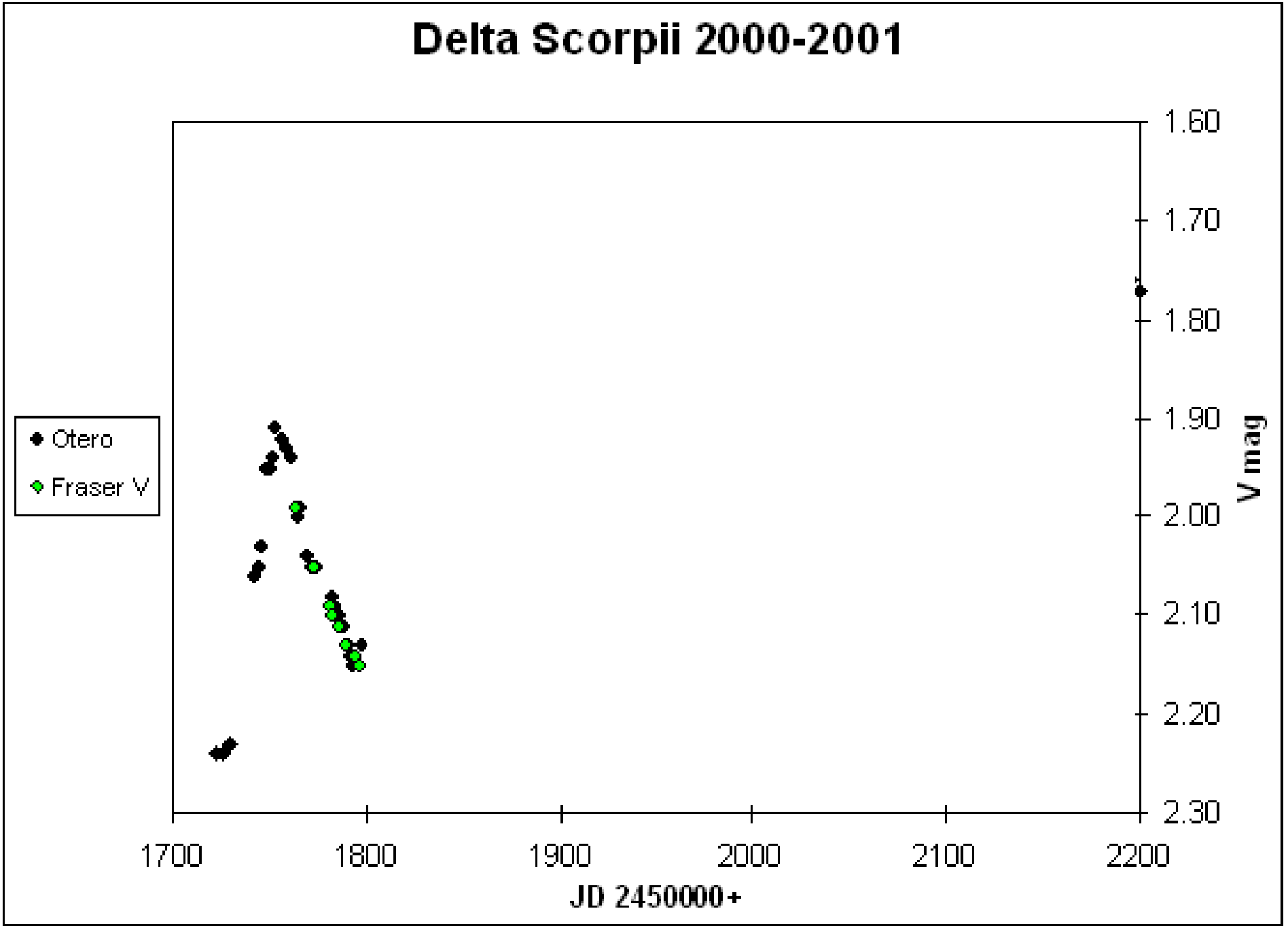
Sebastian Otero, Argentina

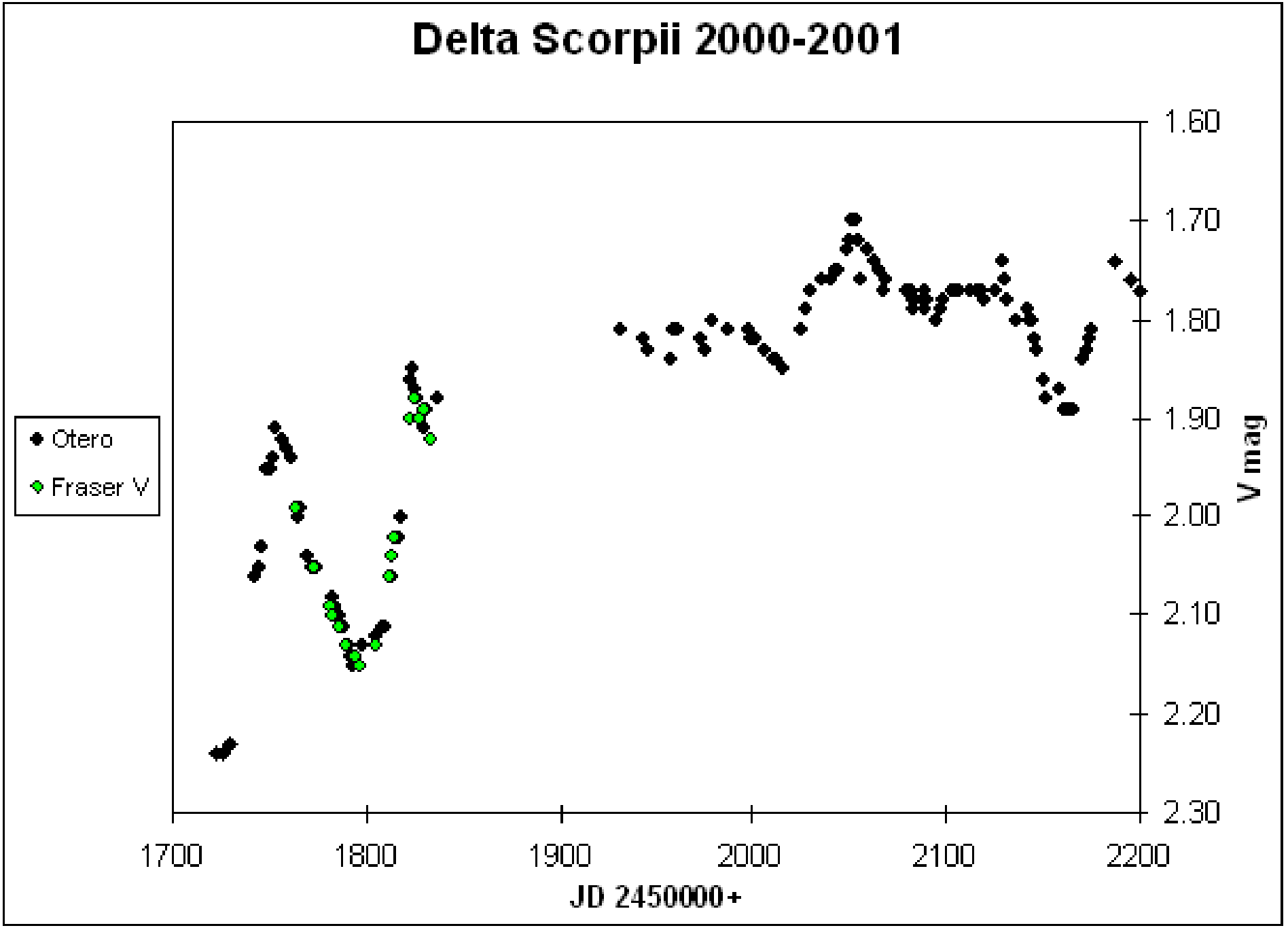

β
M80
Delta
Antares
— M4
α
SCORPIUS
ε
— M6
μ
— M7
λ
Sting
υ
G
ζ

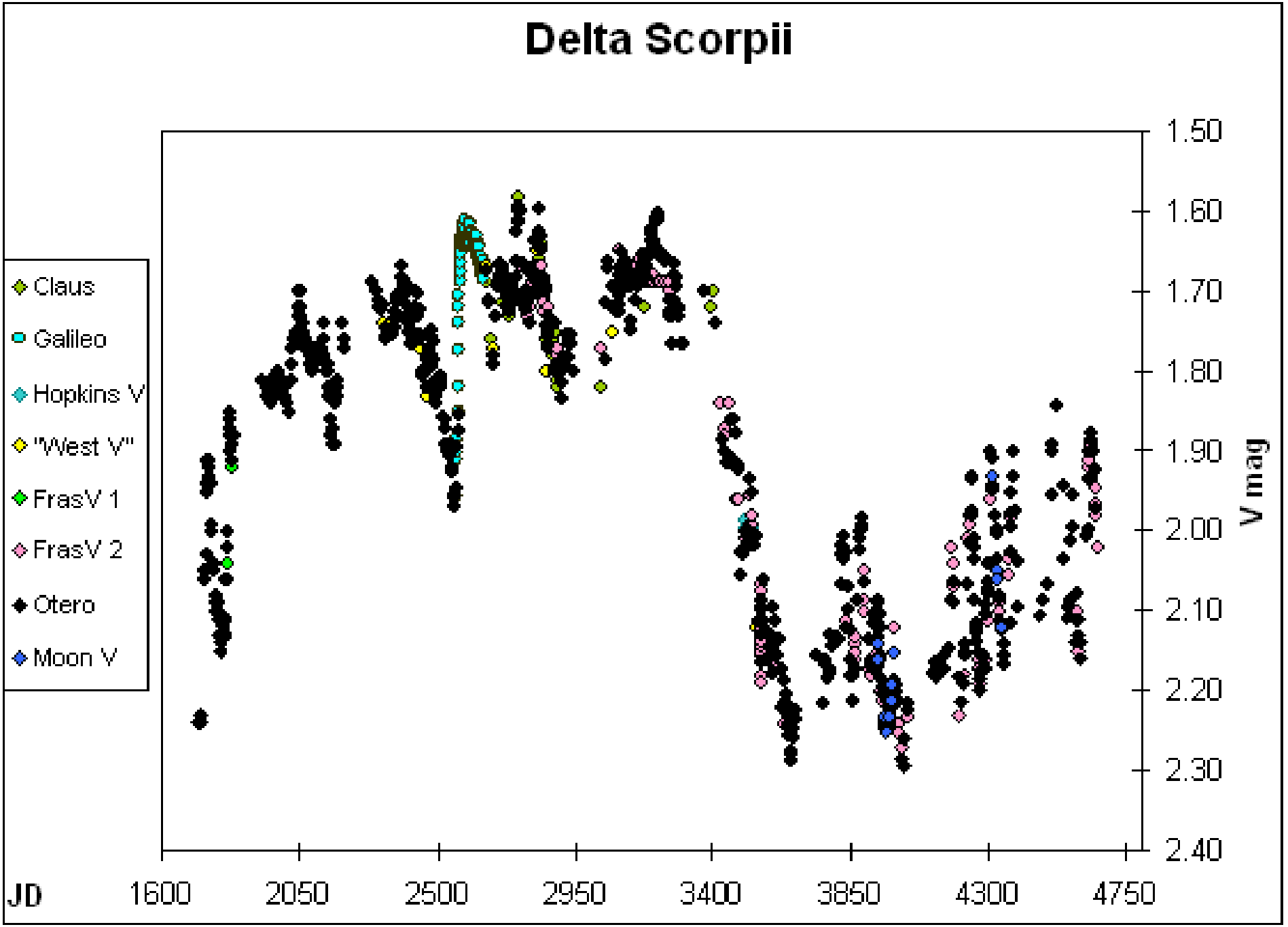
- B*e* Stars are

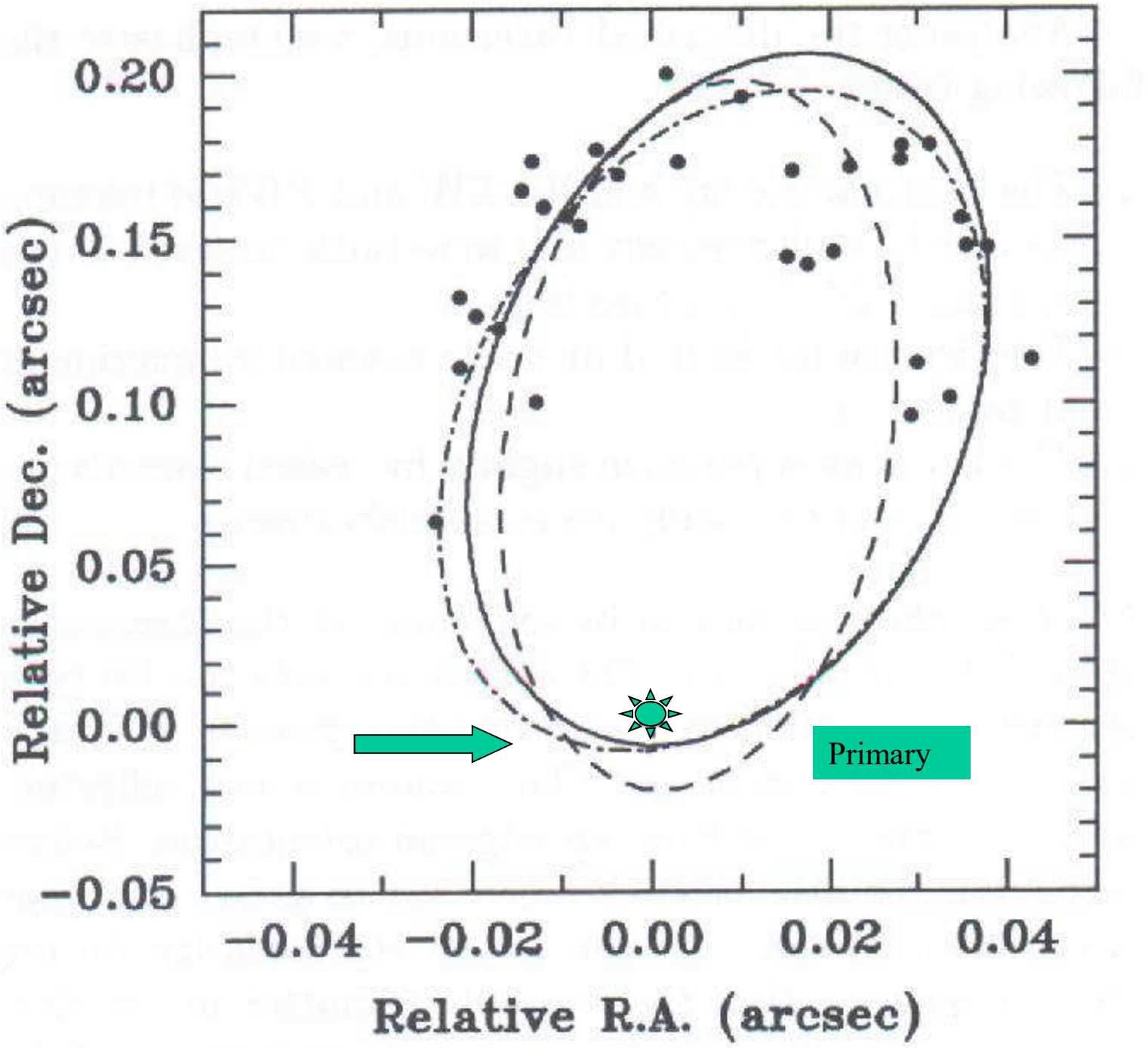
- Young
- Big
- Hot
- *A Puzzle!*

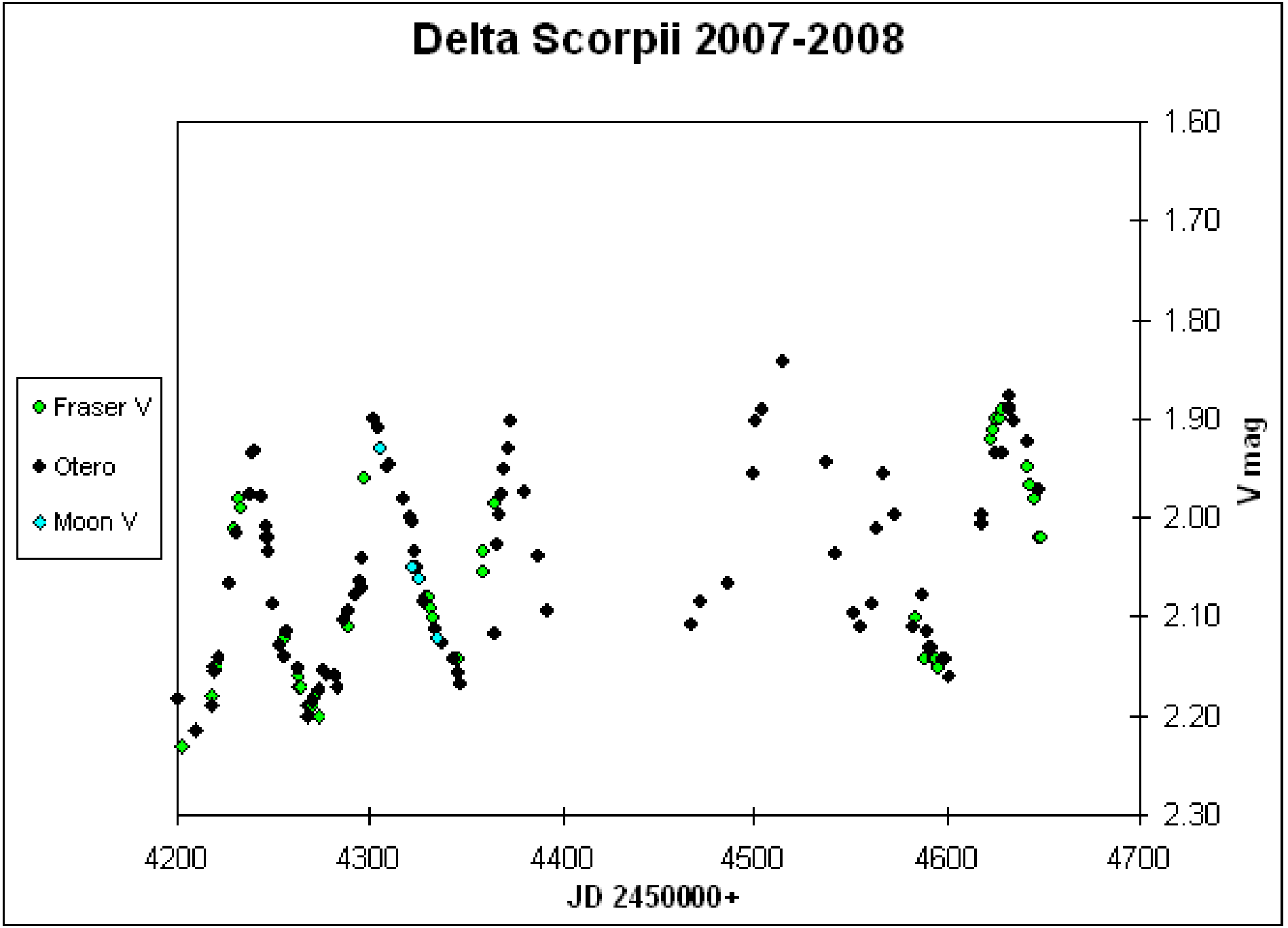

0.20
0.15
0.10
0.05
0.00
−0.05
Relative Dec. (arcsec)
−0.04
−0.02
0.00
0.02
0.04
Relative R.A. (arcsec)
Primary

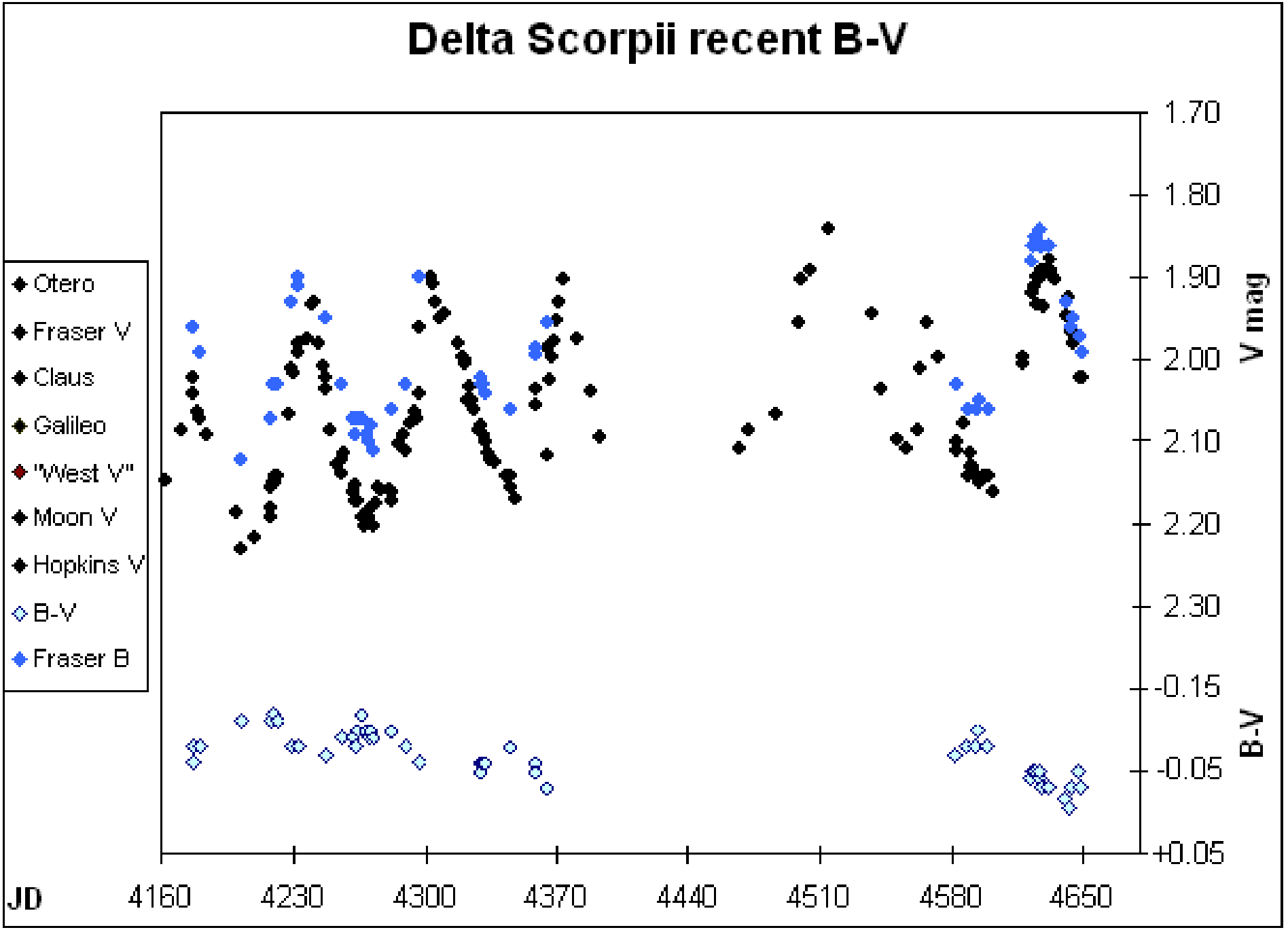

Delta Scorpii 2000-2001
Otero
Fraser V
1.60
1.70
1.80
1.90
2.00
2.10
2.20
2.30
V mag
1700
1800
1900
2000
2100
2200
JD 2450000+

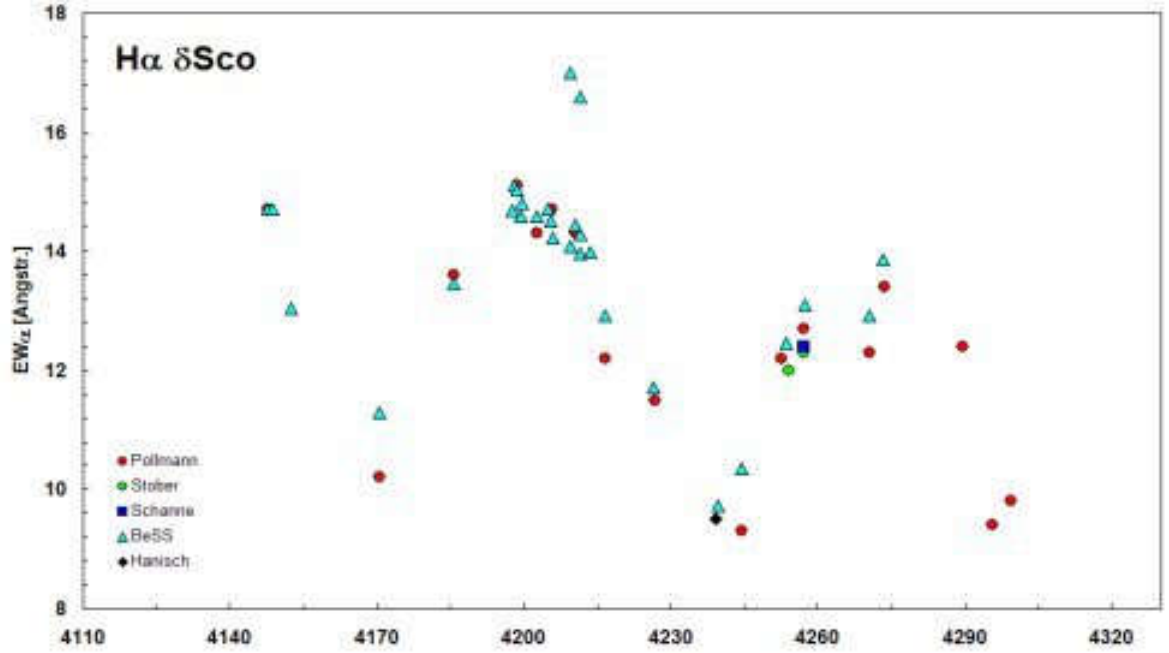

Delta Scorpii 2000-2001
Otero
Fraser V
1.60
1.70
1.80
1.90
2.00
2.10
2.20
2.30
V mag
1700
1800
1900
2000
2100
2200
JD 2450000+

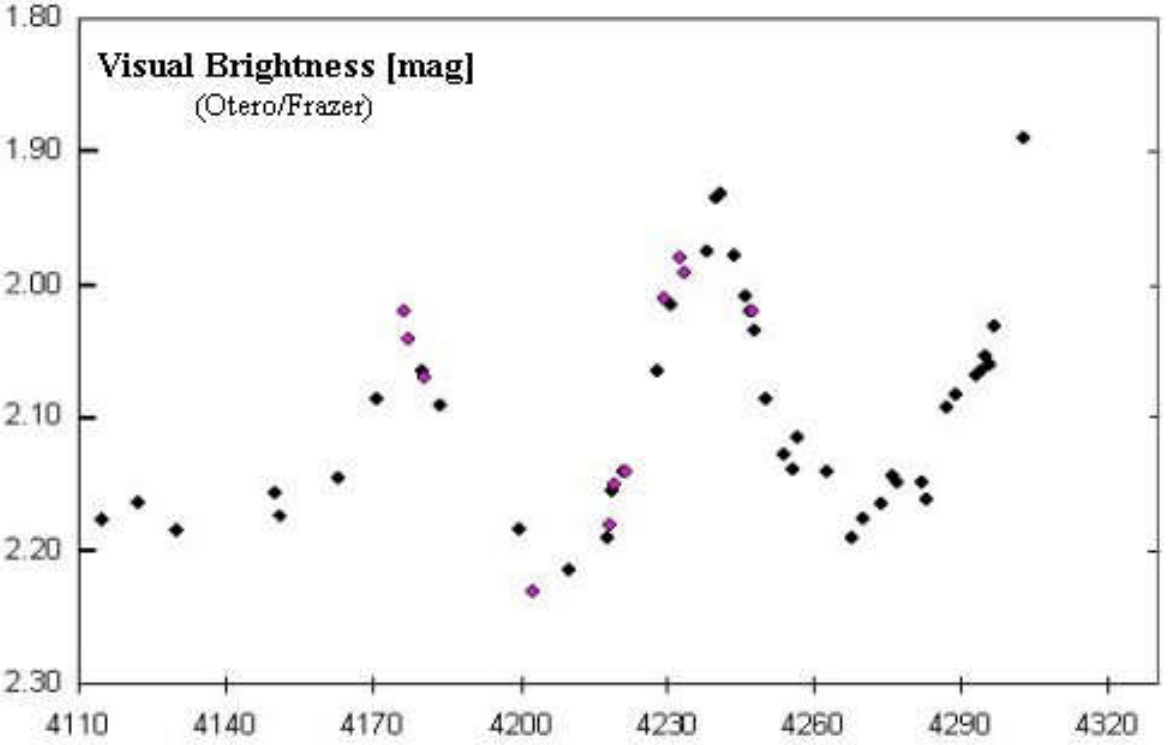

Delta Scorpii
Claus
Galileo
Hopkins V
"West V"
FrasV 1
FrasV 2
Otero
Moon V
1.50
1.60
1.70
1.80
1.90
2.00
2.10
2.20
2.30
2.40
V mag
JD
1600
2050
2500
2950
3400
3850
4300
4750

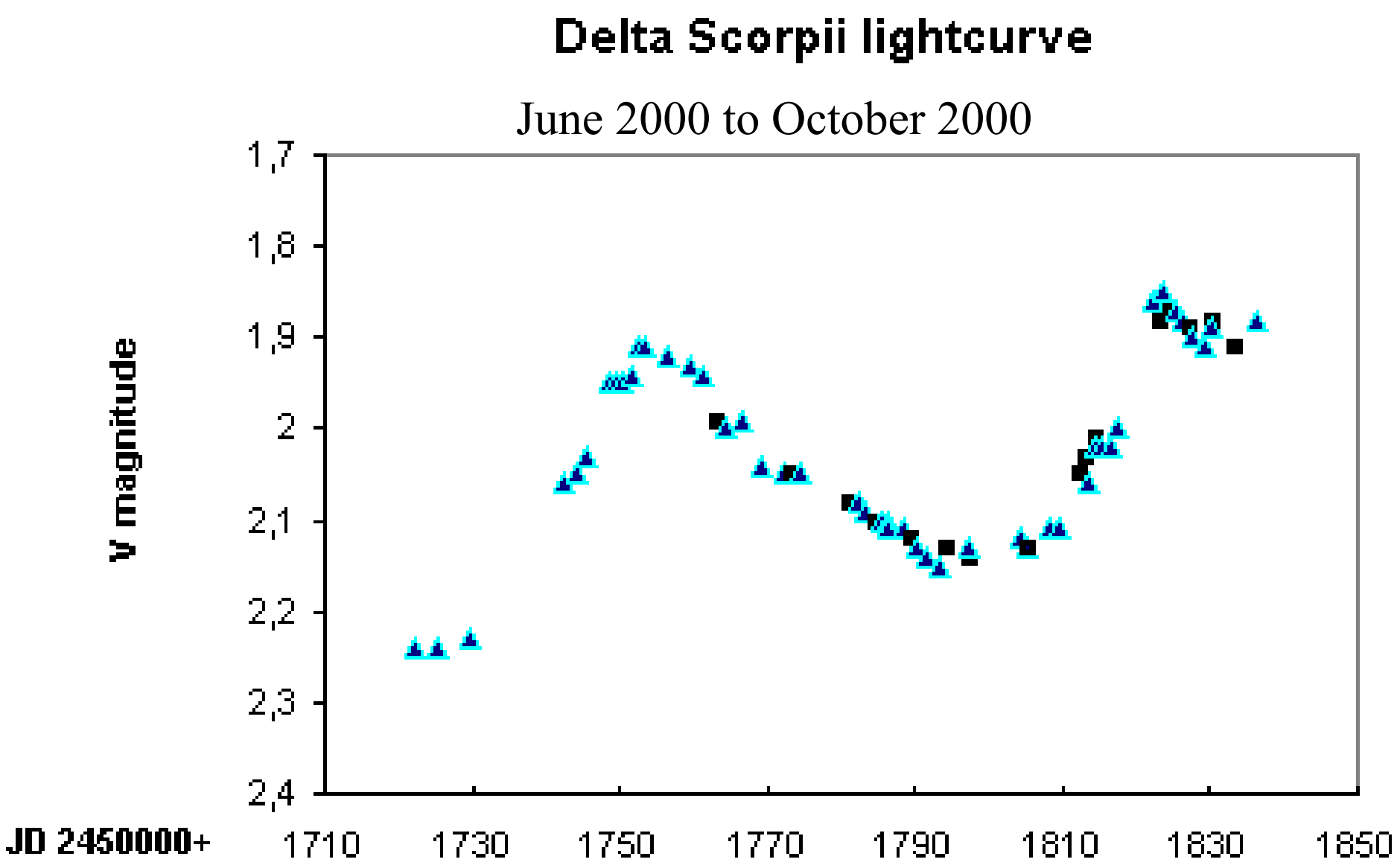

0.20
0.15
0.10
0.05
0.00
−0.05
Relative Dec. (arcsec)
−0.04
−0.02
0.00
0.02
0.04
Relative R.A. (arcsec)
Primary

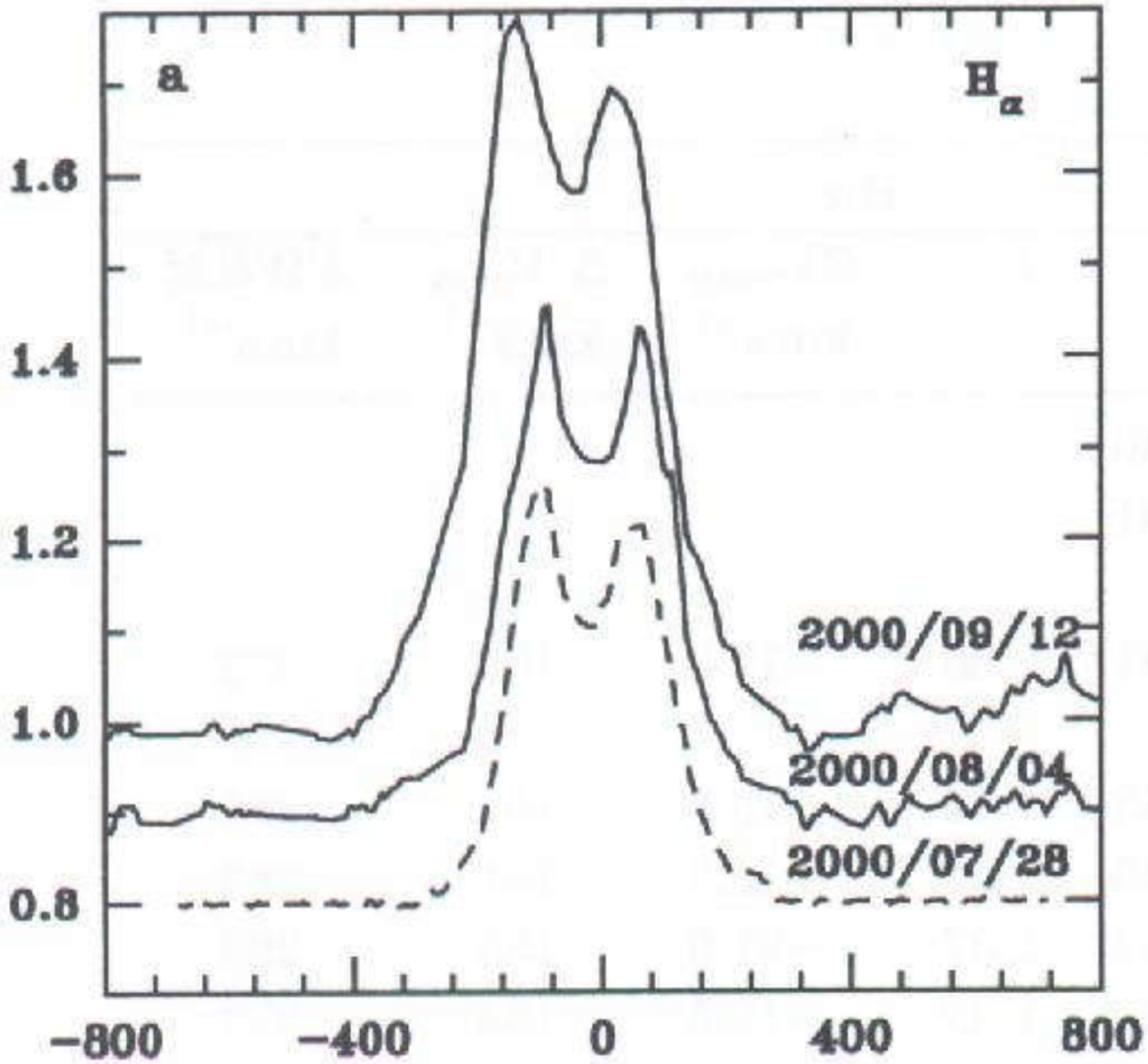

Delta Scorpii 2007-2008
Fraser V
Otero
Moon V
1.60
1.70
1.80
1.90
2.00
2.10
2.20
2.30
V mag
4200
4300
4400
4500
4600
4700
JD 2450000+

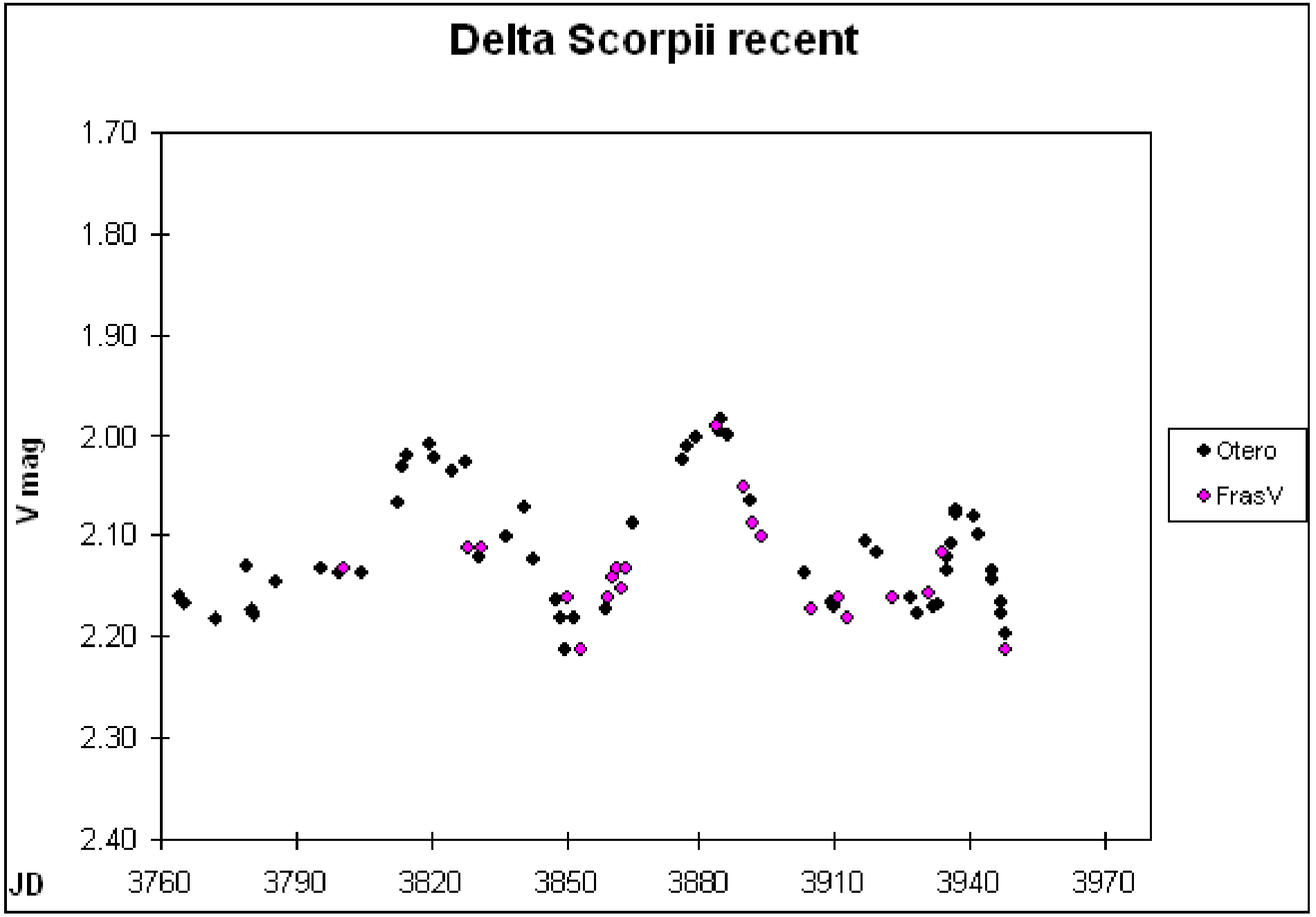

Delta Scorpii recent B-V
Otero
Fraser V
Claus
Galileo
"West V"
Moon V
Hopkins V
B-V
Fraser B
1.70
1.80
1.90
2.00
2.10
2.20
2.30
V mag
-0.15
-0.05
+0.05
B-V
JD
4160
4230
4300
4370
4440
4510
4580
4650

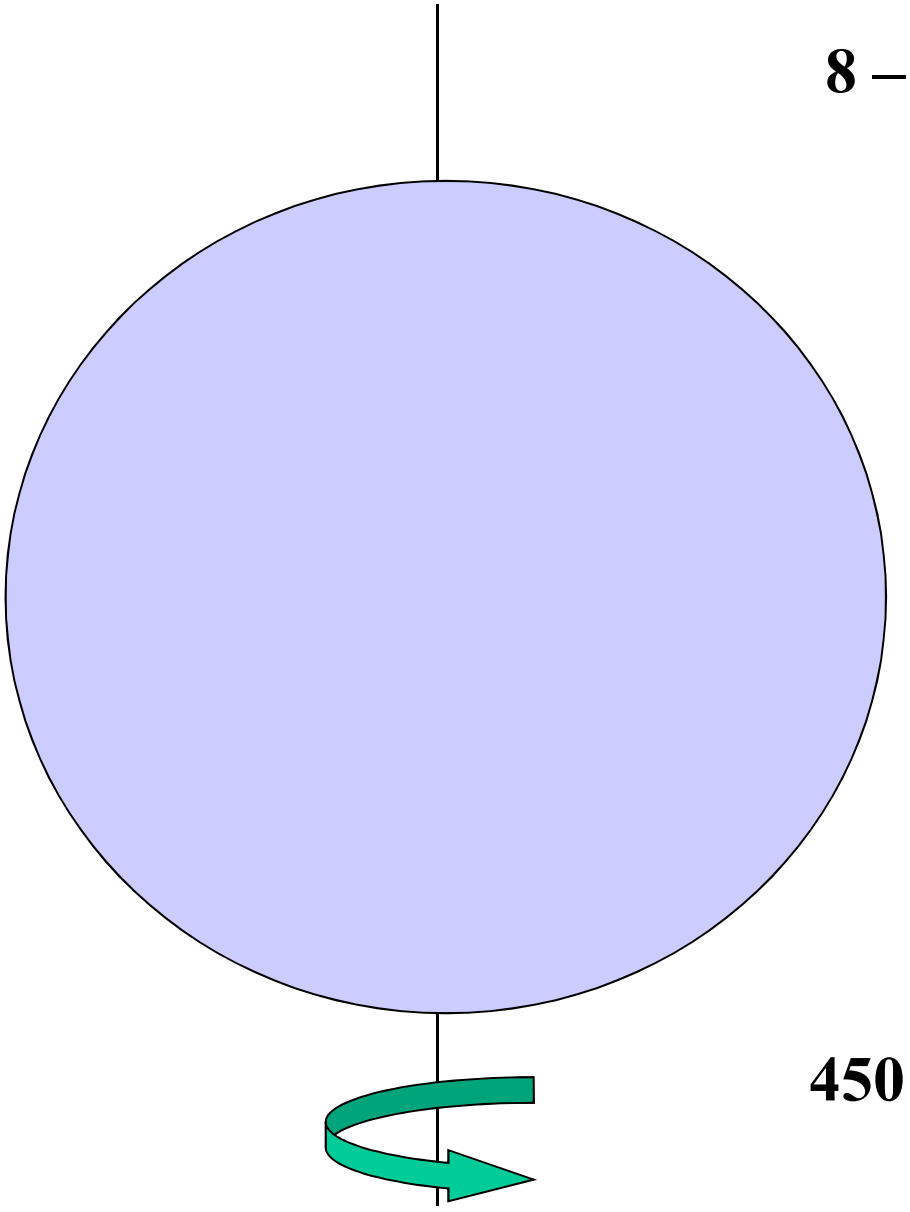

Hα δSco
EWα [Angstr.]
18
16
14
12
10
8
4110
4140
4170
4200
4230
4260
4290
4320
Pollmann
Stober
Schanne
BeSS
Hanisch


Visual Brightness [mag]
(Otero/Frazer)
1.80
1.90
2.00
2.10
2.20
2.30
4110
4140
4170
4200
4230
4260
4290
4320


Delta Scorpii lightcurve
June 2000 to October 2000
V magnitude
1,7
1,8
1,9
2
2,1
2,2
2,3
2,4
JD 2450000+
1710
1730
1750
1770
1790
1810
1830
1850


a
H_α
1.6
1.4
1.2
1.0
0.8
2000/09/12
2000/08/04
2000/07/28
−800
−400
0
400
800

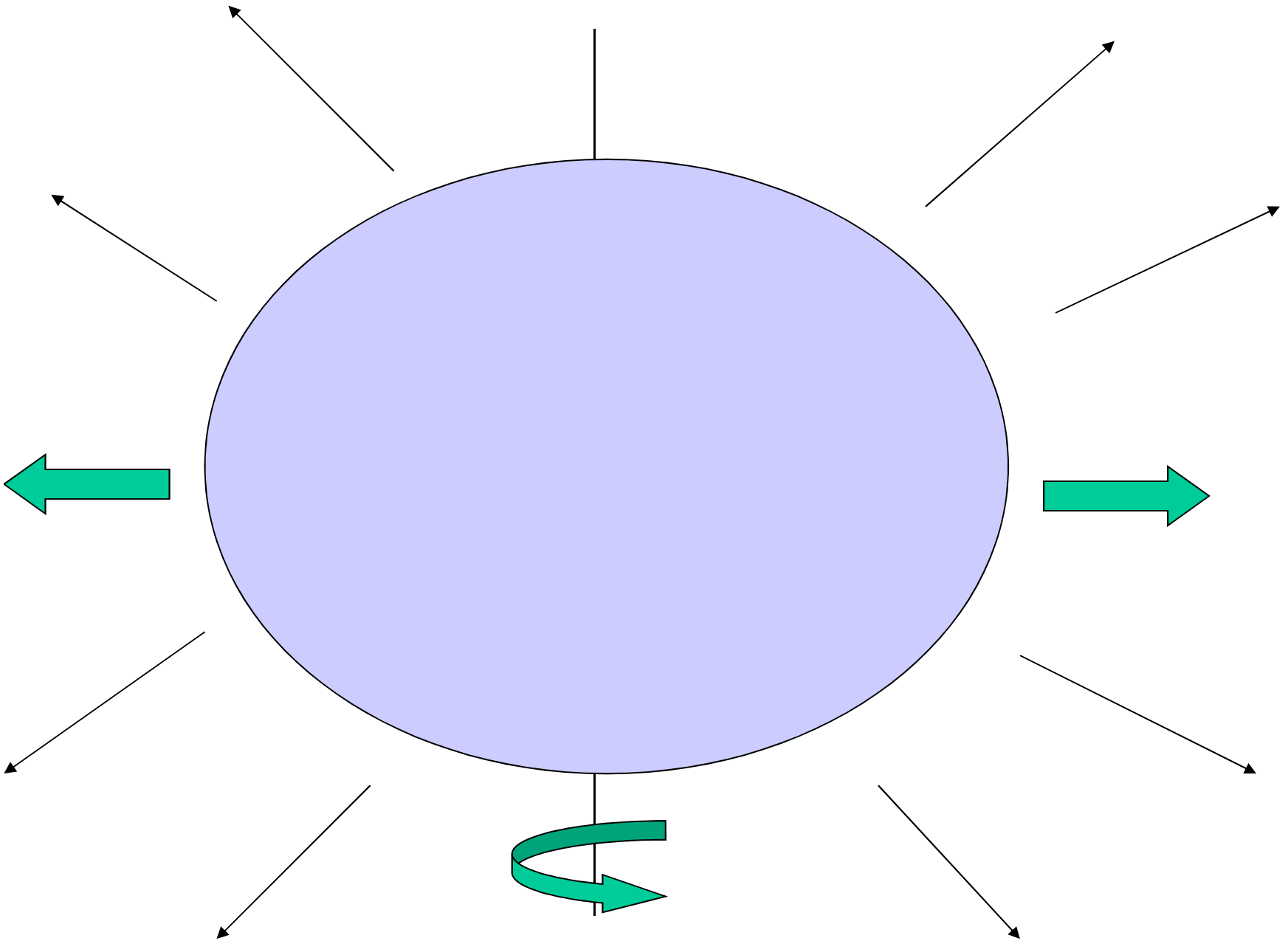

Delta Scorpii recent
1.70
1.80
1.90
2.00
2.10
2.20
2.30
2.40
V mag
JD
3760
3790
3820
3850
3880
3910
3940
3970
Otero
FrasV

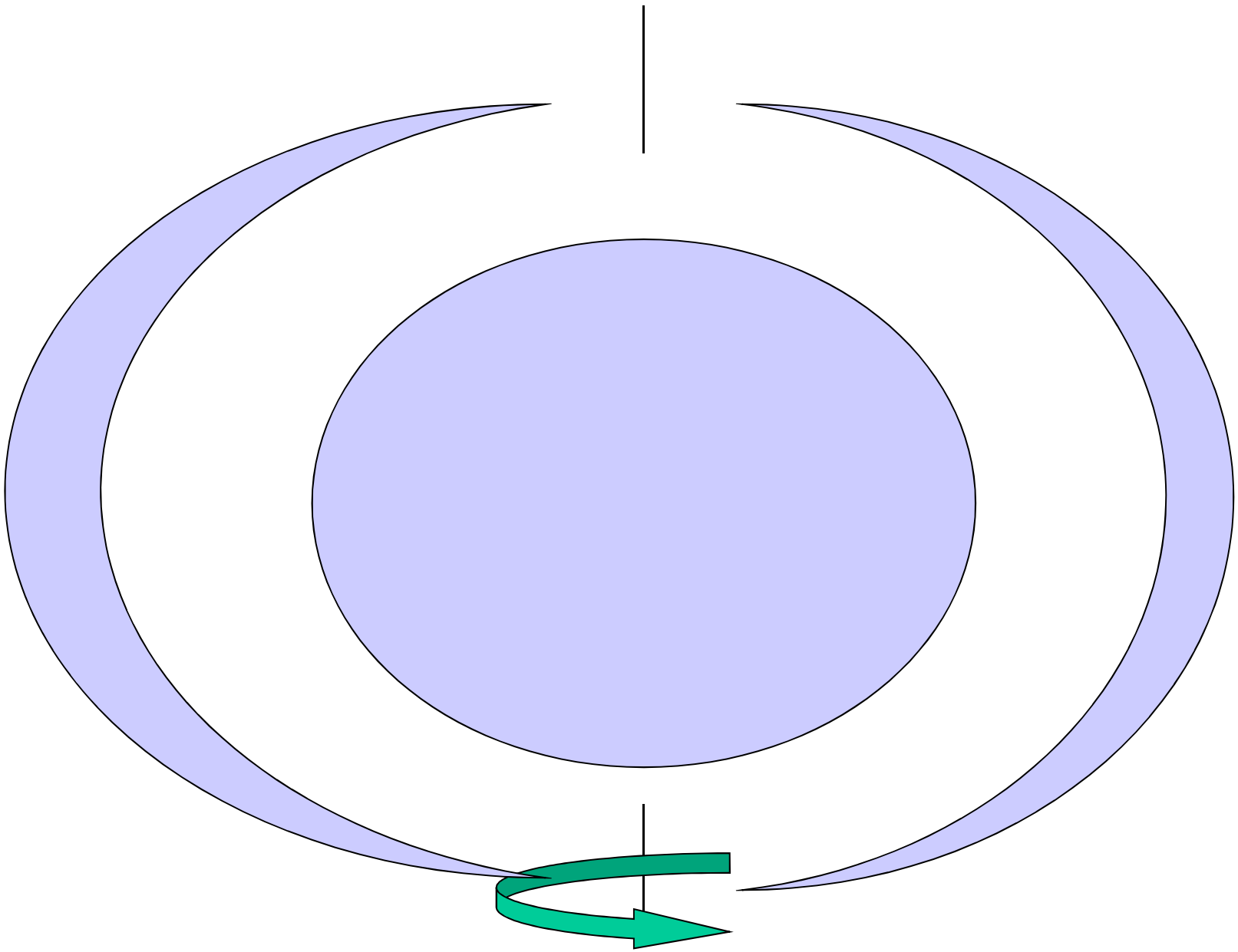


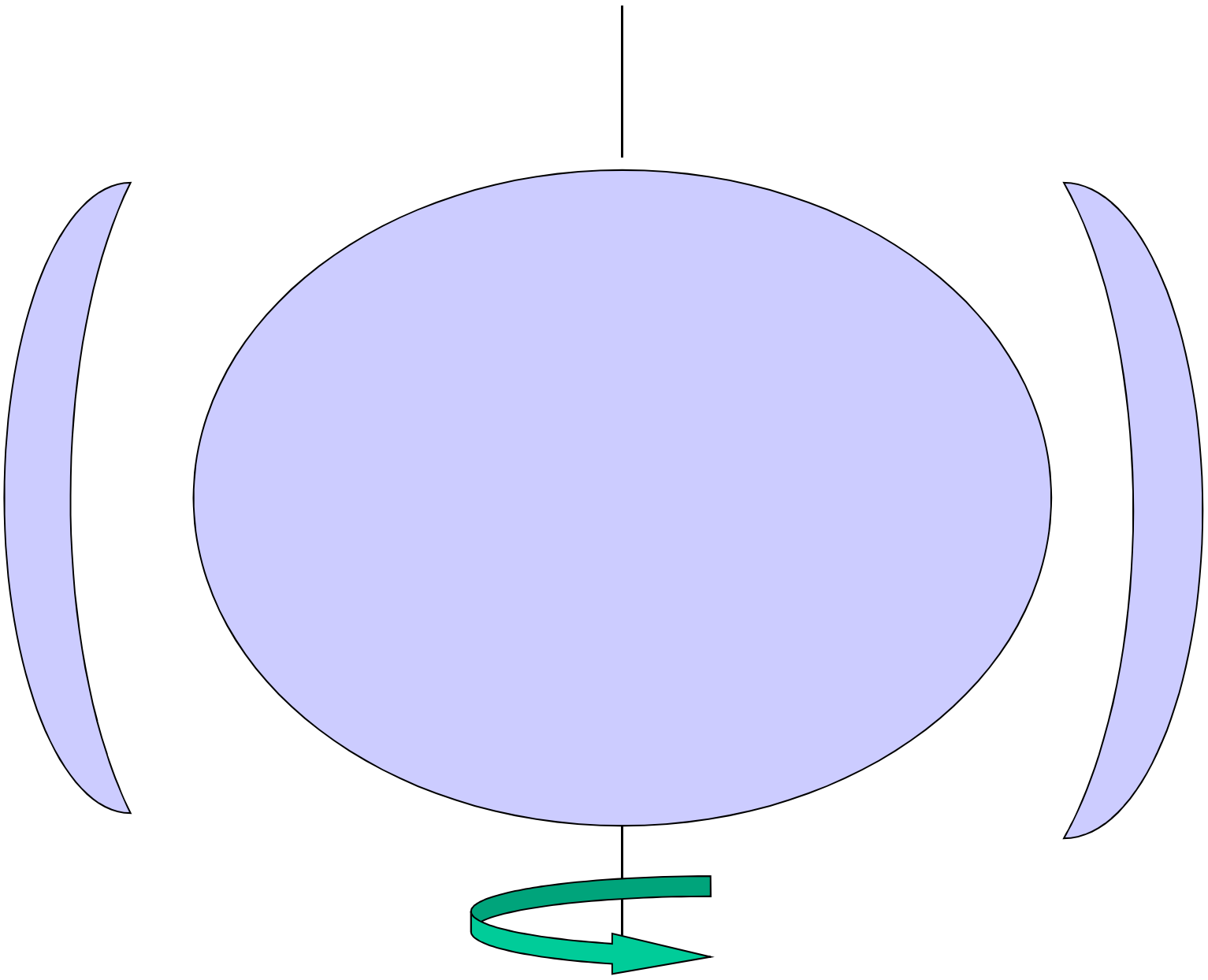
8 – 20 Solar mass

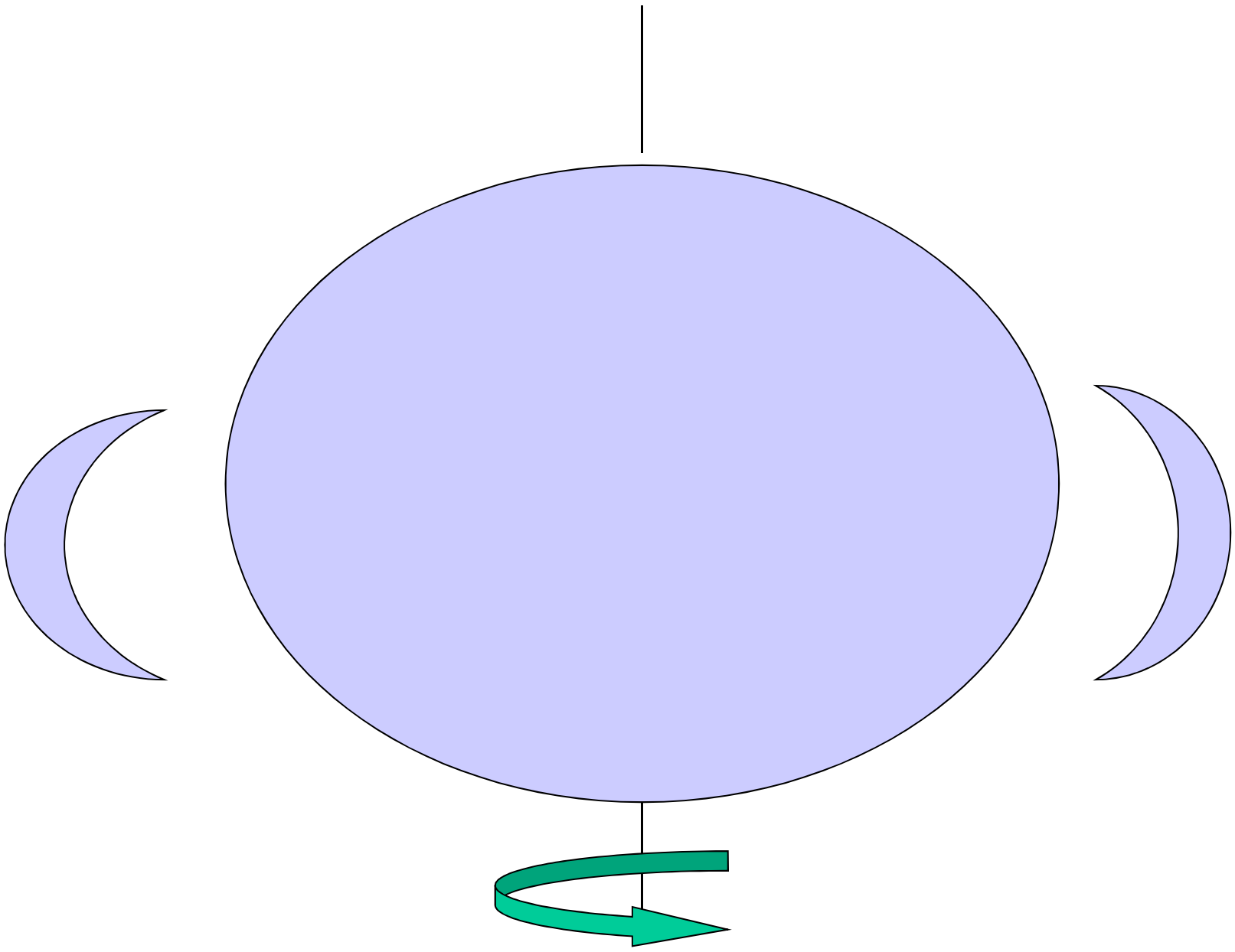
28,000 deg

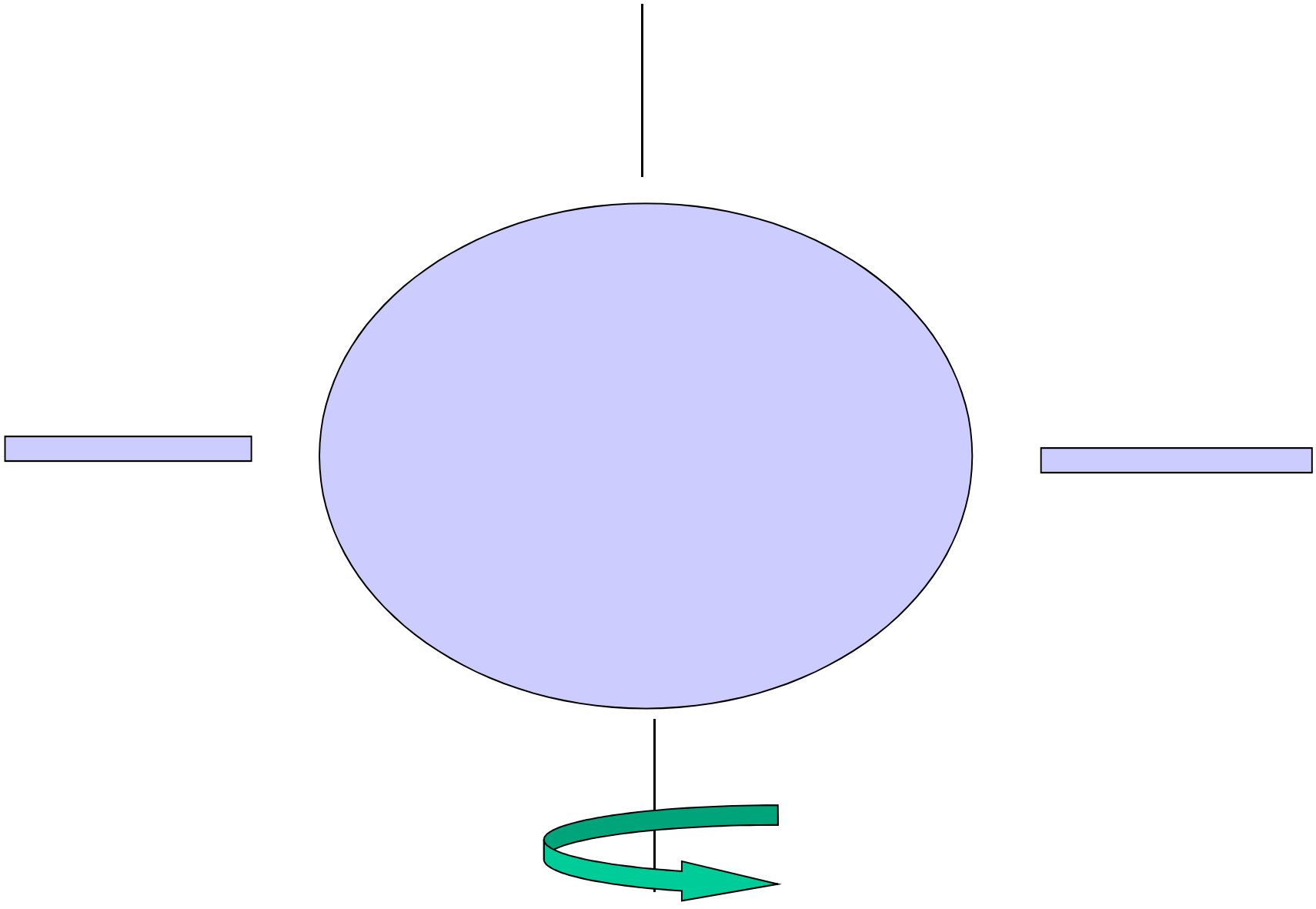
450 km/sec

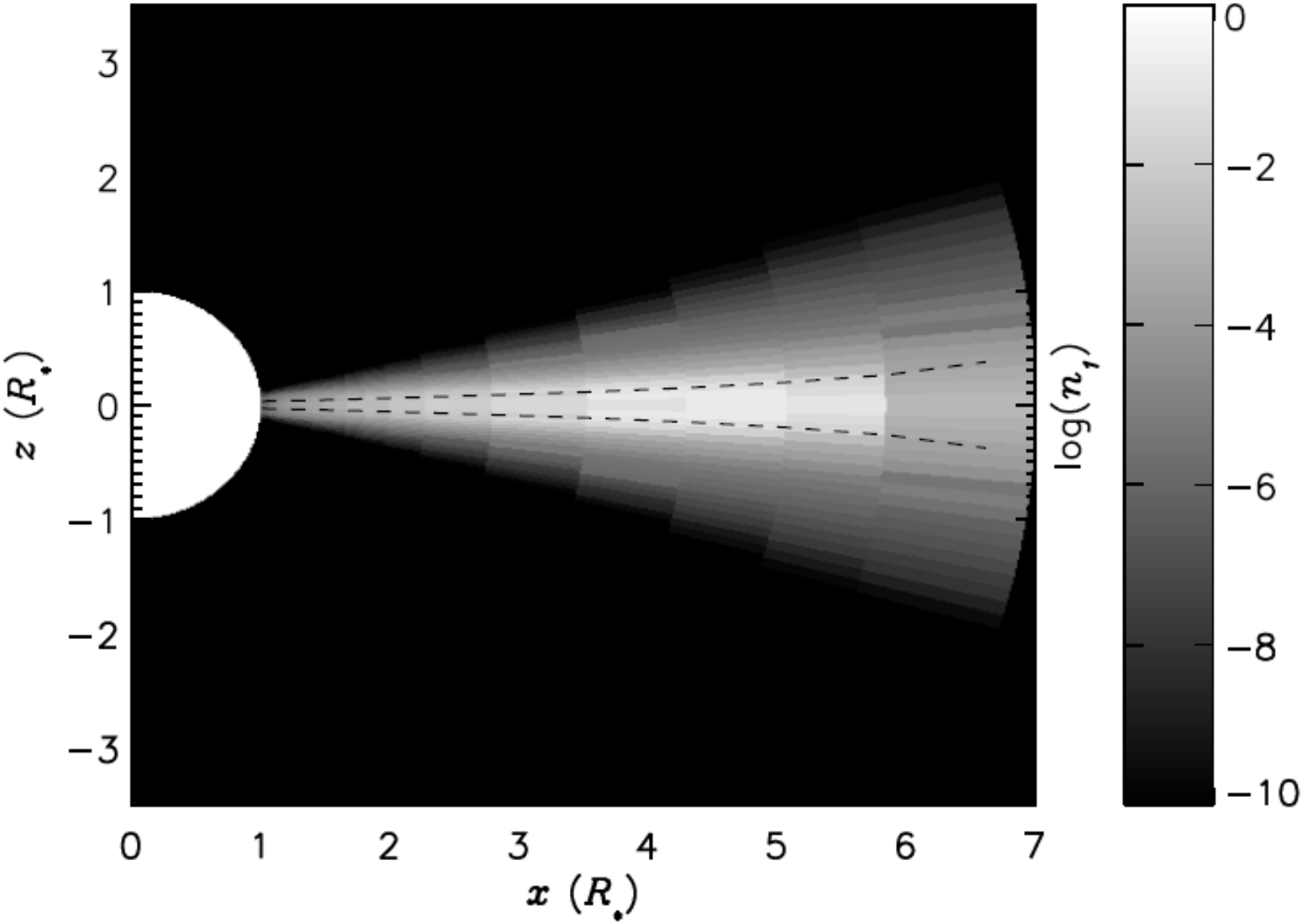











3
2
1
0
−1
−2
−3
z (R*)
0
1
2
3
4
5
6
7
x (R*)
log(n_t)
0
−2
−4
−6
−8
−10

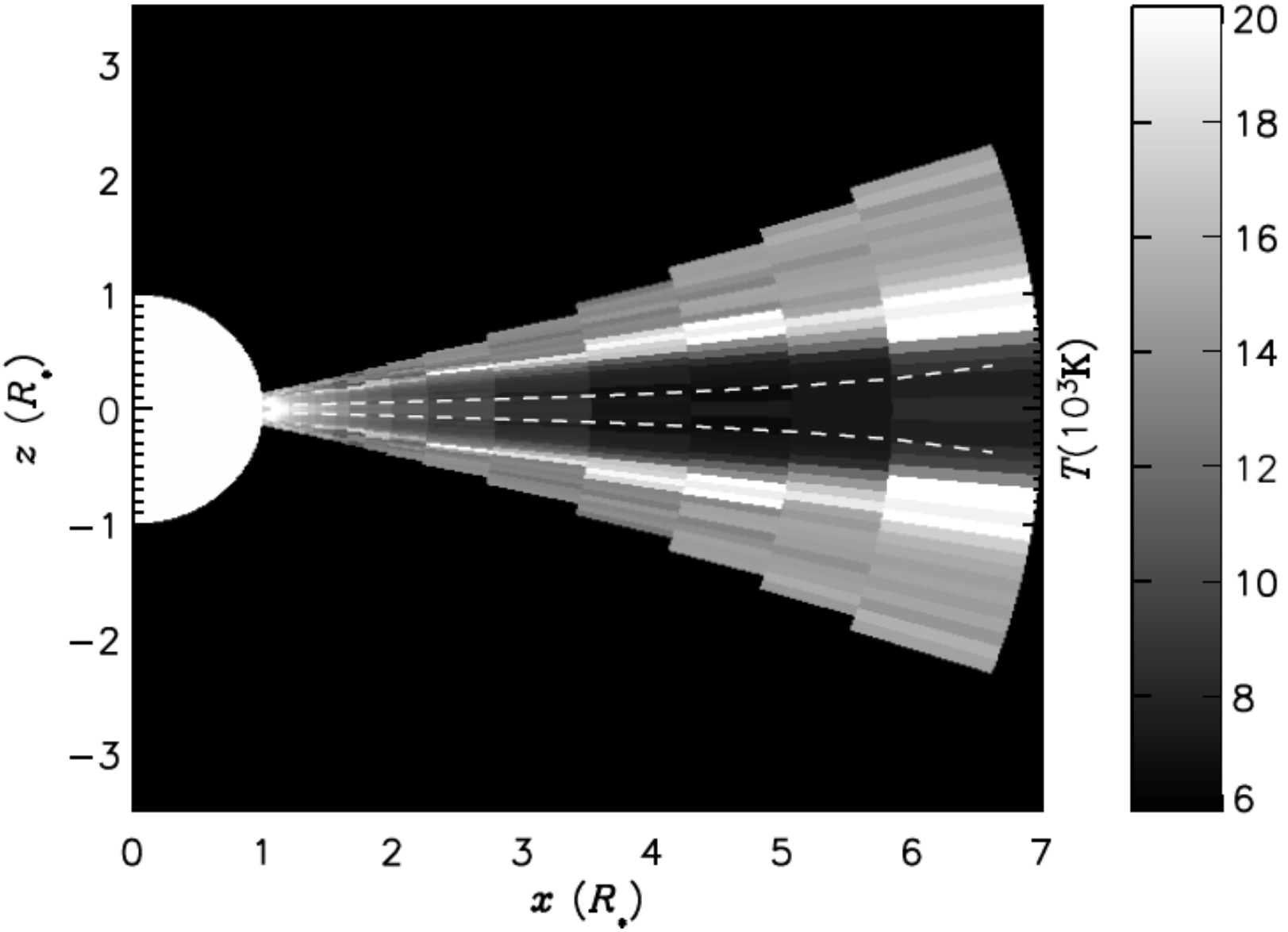
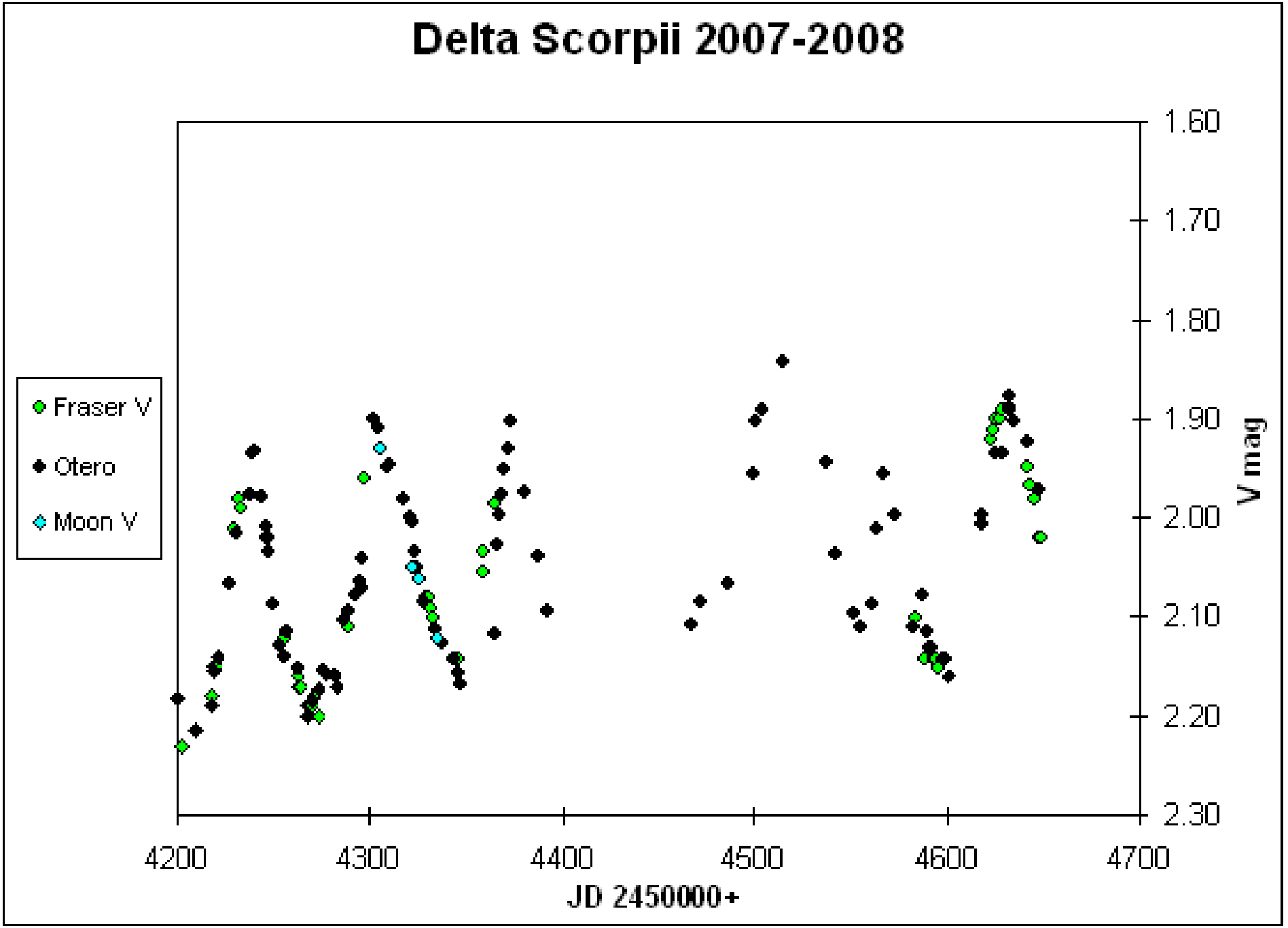
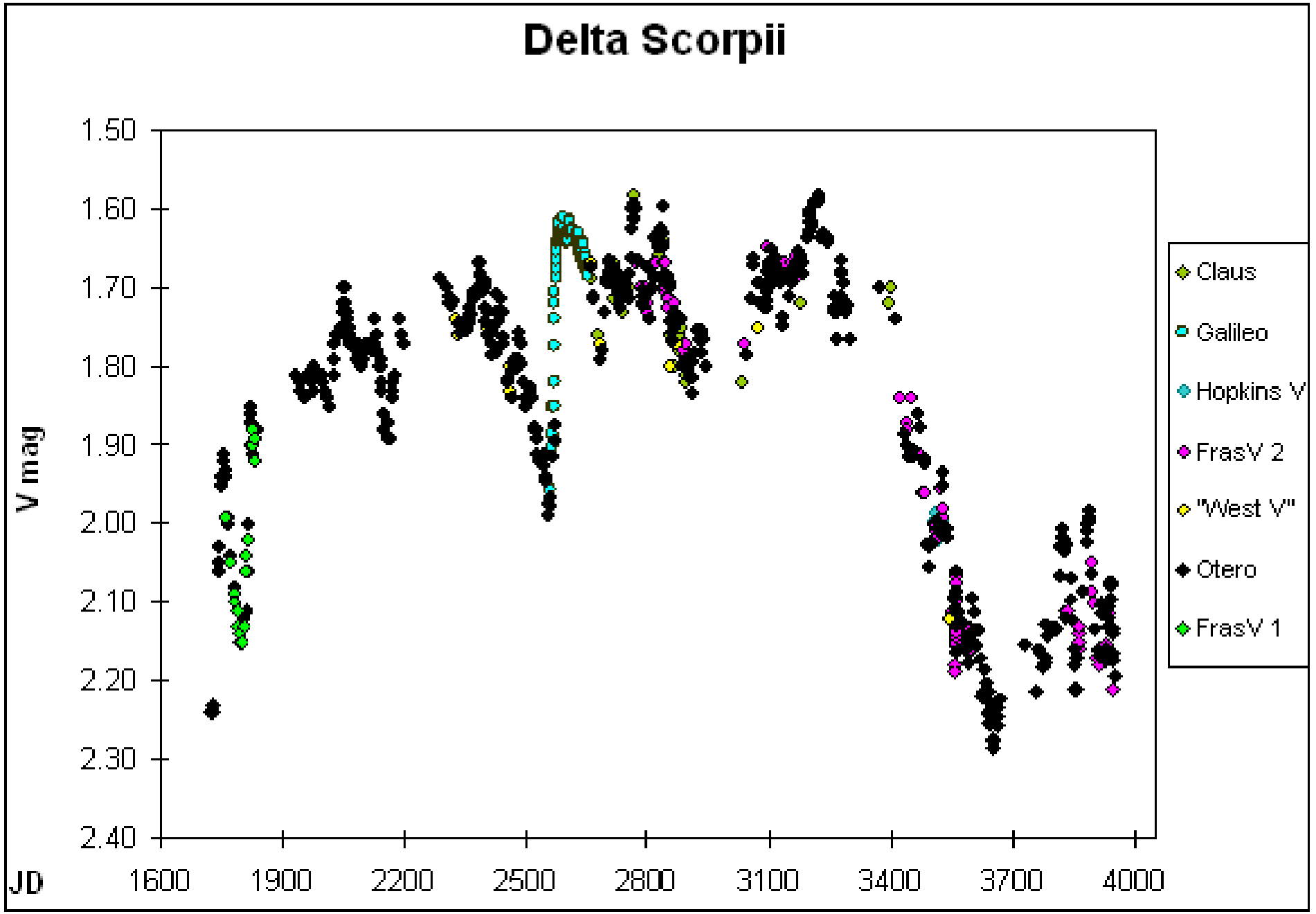
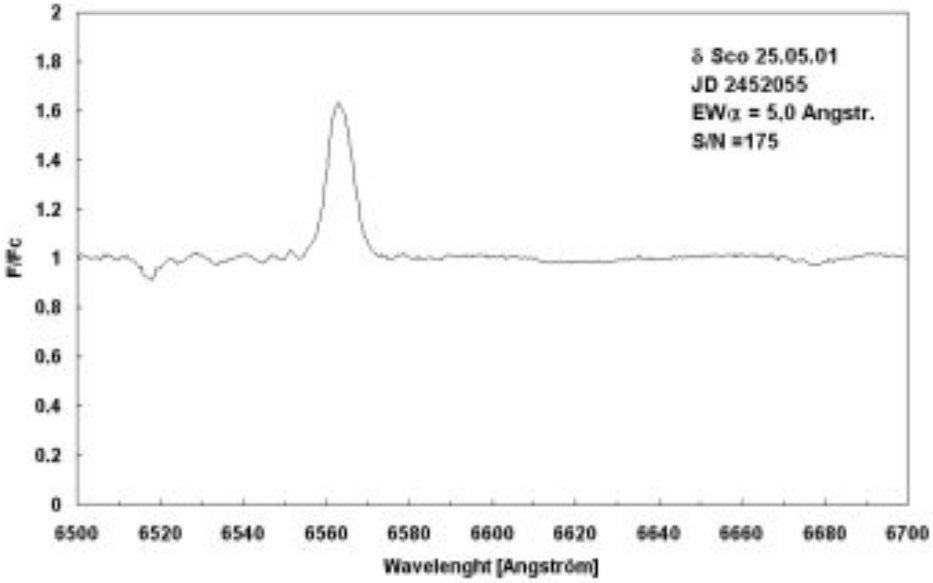
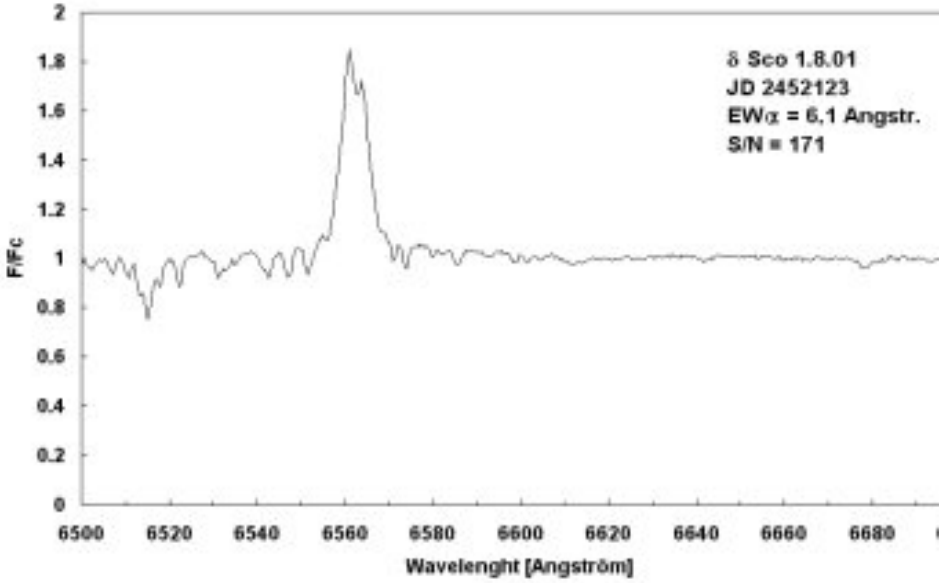


Fig. 6.— Temperature distribution of the best-fitting model. The plot shows the temperature as a function of x and z. The dashed lines correspond to the curves $z = \pm H(x)$ and show


Delta Scorpii 2007-2008
Fraser V
Otero
Moon V
1.60
1.70
1.80
1.90
2.00
2.10
2.20
2.30
V mag
4200
4300
4400
4500
4600
4700
JD 2450000+


Delta Scorpii
V mag
1.50
1.60
1.70
1.80
1.90
2.00
2.10
2.20
2.30
2.40
JD
1600
1900
2200
2500
2800
3100
3400
3700
4000
Claus
Galileo
Hopkins V
FrasV 2
"West V"
Otero
FrasV 1


δ Sco 25.05.01
JD 2452055
EWα = 5,0 Angstr.
S/N =175
F/Fc
Wavelenght [Angström]


δ Sco 1.8.01
JD 2452123
EWα = 6,1 Angstr.
S/N = 171
F/Fc
Wavelenght [Angström]