SMM C/P 1989 DOY108 150 +/- 0 degrees

height = h + velocity*time   # data points = 4

Top of Bright Dimple on Front
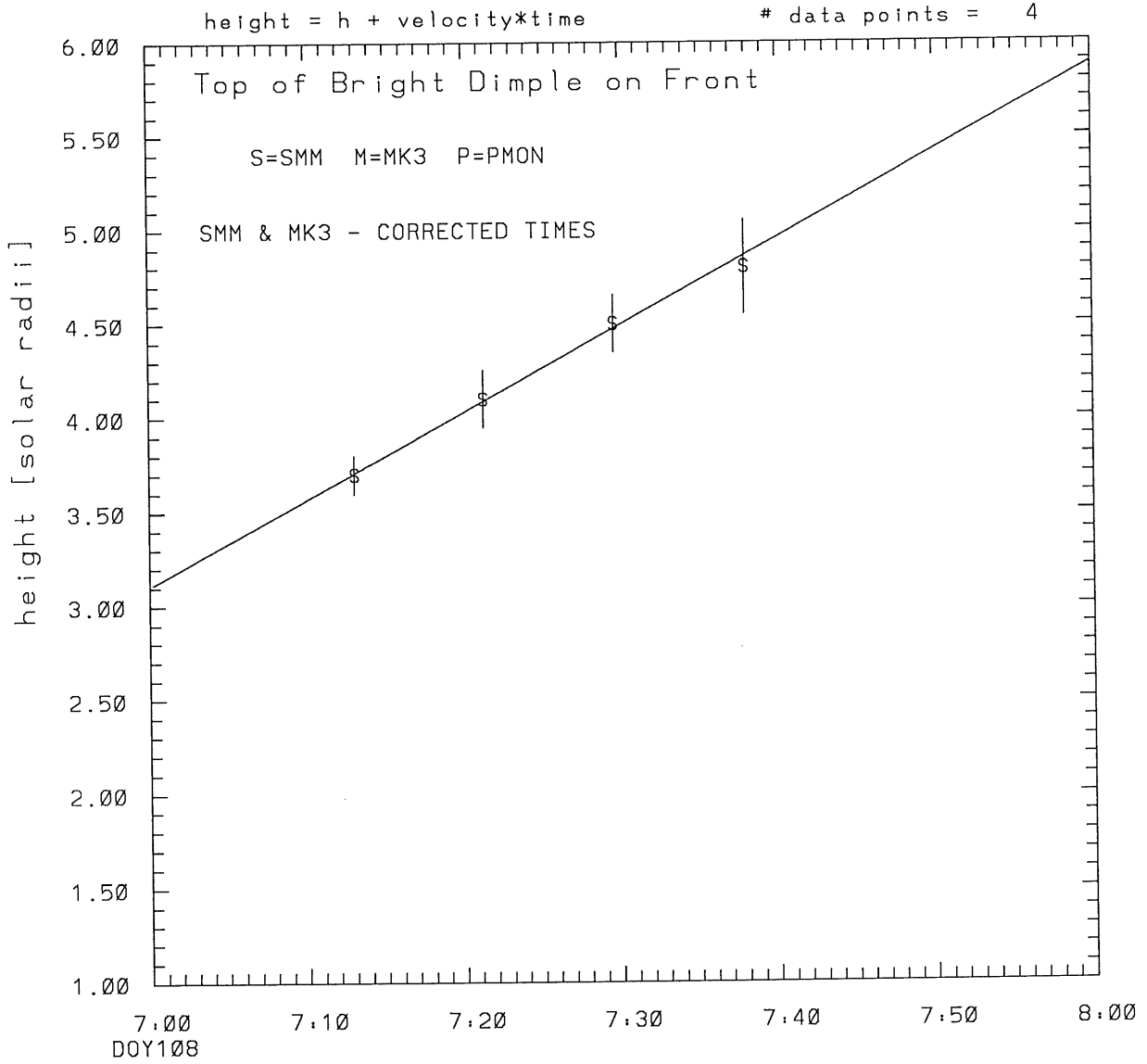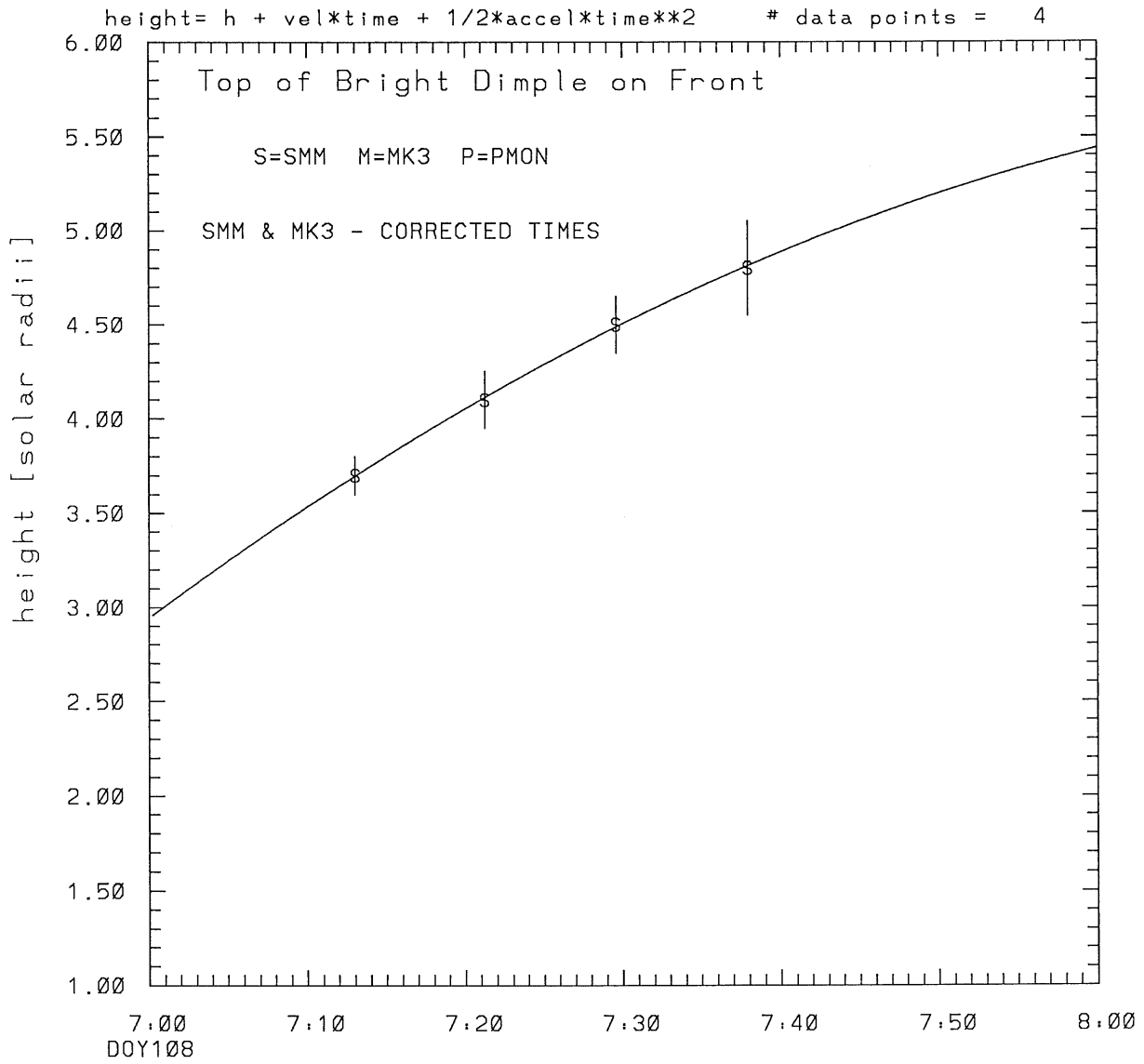
S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

height [solar radii]

tstart=DOY108 6:16 +/-   0.8 [min.]
radial velocity= 536. +/- 18. [km/sec]

SMM C/P 1989 DOY108 150 +/- 0 degrees

height= h + vel*time + 1/2*accel*time**2   # data points =   4

Top of Bright Dimple on Front

S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

height [solar radii]

6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00

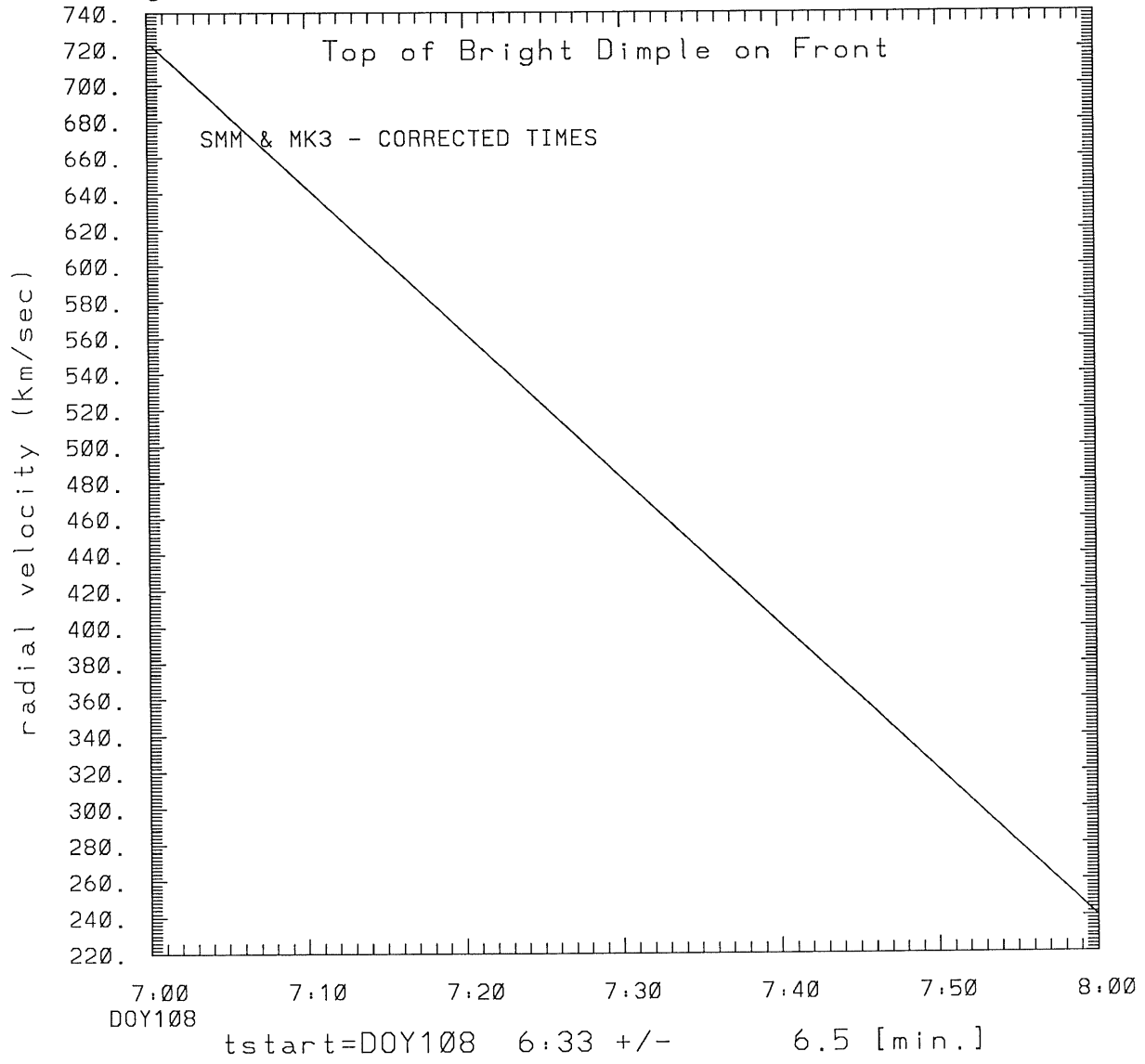7:00   7:10   7:20   7:30   7:40   7:50   8:00
DOY108

tstart=DOY108 6:33 +/-   6.5 [min.]

radial acceleration=-0.1347 +/- 0.0445 [km/sec**2]

SMM C/P 1989 DOY108 150 +/- 0 degrees

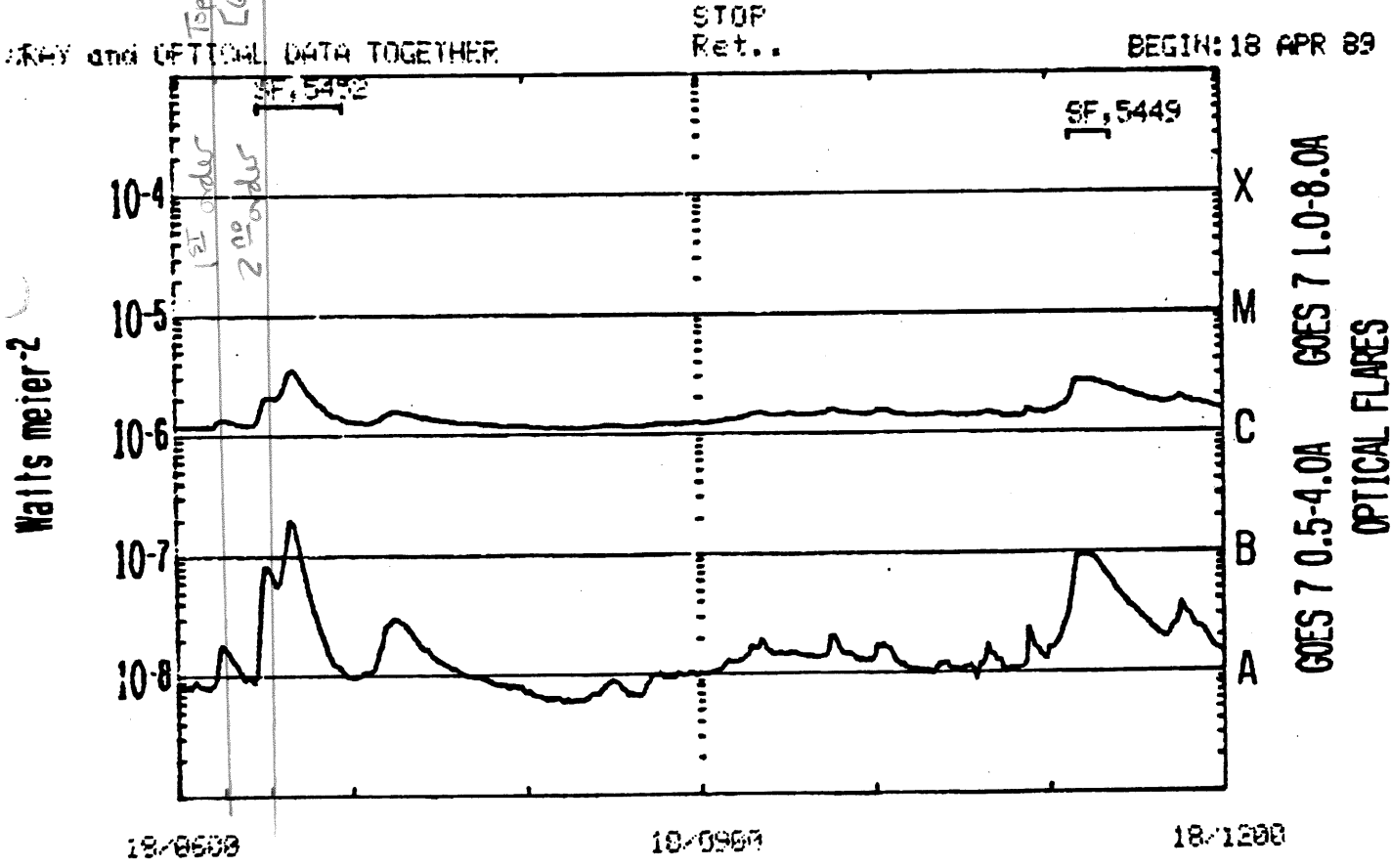height= h + vel*time + 1/2*accel*time**2   # data points = 4

Top of Bright Dimple on Front

SMM & MK3 - CORRECTED TIMES

tstart=DOY108 6:33 +/-   6.5 [min.]

radial acceleration=-.135E+00 km/sec**2

Top of Bright Dimple on Front center measured @ 150°
[6:16] 1st order; [6:33] 2nd order

1st order
2nd order

RAY and OPTICAL DATA TOGETHER

STOP
Ret..

BEGIN: 18 APR 89

SF,5448

SF,5449

Watts meter⁻²

10^{-4}

10^{-5}

10^{-6}

10^{-7}

10^{-8}

X

M

C

B

A

GOES 7 1.0-8.0A

GOES 7 0.5-4.0A

OPTICAL FLARES

18/0600

18/0900

18/1200

SAA's
NIGHT

GOES-7 1 MIN DATA; OPTICAL FLARE DUR. IMP. REGION

RUN: 1619UT
24 APR 89

```
********************
 This is a 1 order run
********************


*******
 INPUT:
*******


                    error in        error in
year doy   time    radii  radius    angle  angle   datatype
1989 108   7:13: 1  3.70 +/- 0.10   150.0 +/- 1.0     SMM
1989 108   7:21:14  4.10 +/- 0.15   150.0 +/- 1.0     SMM
1989 108   7:29:35  4.50 +/- 0.15   150.0 +/- 1.0     SMM
1989 108   7:37:56  4.80 +/- 0.25   150.0 +/- 1.0     SMM


*****************************************
 Structure being measured:
Top of Bright Dimple on Front
*****************************************


********
 OUTPUT:
********


START TIME:


Event began at t = 0 + -0.455E+02 +/-  0.841E+00 [minutes]
In more convenient units:
Event began at DOY 108  6:16 +/-  0.841E+00 [minutes]


Origin defined at DOY108  7: 0


RADIAL INFORMATION:


RADIAL VELOCITY =   536. +/-    18. km/sec


The computed RADIAL coefficients and errors FROM NLLST2 are:


c(1) =    0.311E+01 +/-   0.338E-01 [solar radii]
c(2) =    0.462E-01 +/-   0.154E-02 [radii/min]
c(2) =    0.536E+03 +/-   0.179E+02 [km/sec]
c(3) =    0.000E+00 +/-   0.000E+00 [radii/min**2]
c(3) =    0.000E+00 +/-   0.000E+00 [km/sec**2]


The computed ERRORS in coefficients [BEVINGTON] are:


          error in c(1)= 0.69043E-01 [radii] see Bevington pg. 114
          error in c(2)= 0.25491E-02 [radii/min] see Bevington pg. 114
ANGULAR INFORMATION:


ANGULAR VELOCITY = 0.0000E+00 +/-   0.0000E+00[radians/sec]


The computed ANGULAR coefficients and errors FROM NLLST2 are:
```

a(1) = 150. +/-   0. [degrees]
a(2) =   0.000E+00 +/-   0.000E+00 [degrees/min]
a(2) =   0.000E+00 +/-   0.000E+00 [rad/sec]
a(3) =   0.000E+00 +/-   0.000E+00 [degrees/min**2]
a(3) =   0.000E+00 +/-   0.000E+00 [rad/sec**2]

THE TANGENTIAL AND TOTAL VELOCITIES AT EACH DATA POINT ARE:
The TANGENTIAL velocity at 7:13 =   0. km/sec
The TOTAL velocity at 7:13 = 536. km/sec

The TANGENTIAL velocity at 7:21 =   0. km/sec
The TOTAL velocity at 7:21 = 536. km/sec

The TANGENTIAL velocity at 7:29 =   0. km/sec
The TOTAL velocity at 7:29 = 536. km/sec

The TANGENTIAL velocity at 7:37 =   0. km/sec
The TOTAL velocity at 7:37 = 536. km/sec

****
The following info is for estimating goodness of the fit
****

Fit is ok [ier=1]

Standard Deviation in the height = 0.48
Standard Deviation in start time measurement =   0.929E+01
Error in time =   0.14485E+01 using best fit method
See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.655E-03
Reduced Chi Squared = 0.839E-02
Chi Squared = 0.168E-01
The probability for exceeding chi square = 0.999E+00

The correlation coefficient =   0.998E+00
The probability that no LINEAR correlation exists between the variables =   0.2366E-02
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]

```
********************
This is a 2 order run
********************


*******
INPUT:
*******
```

year	doy	time	radii radius	error in radius	angle	error in angle	datatype
1989	108	7:13: 1	3.70 +/- 0.10		150.0 +/- 1.0		SMM
1989	108	7:21:14	4.10 +/- 0.15		150.0 +/- 1.0		SMM
1989	108	7:29:35	4.50 +/- 0.15		150.0 +/- 1.0		SMM
1989	108	7:37:56	4.80 +/- 0.25		150.0 +/- 1.0		SMM

```
*****************************************
Structure being measured:
Top of Bright Dimple on Front
*****************************************


********
OUTPUT:
********


START TIME:

Event began at t = 0 + -0.270E+02 +/-  0.646E+01 [minutes]
In more convenient units:
Event began at DOY 108  6:33 +/-  0.646E+01 [minutes]


Origin defined at DOY108  7: 0


RADIAL INFORMATION:


RADIAL ACCELERATION = -0.135E+00 +/-  0.445E-01 km/sec**2


The computed RADIAL coefficients and errors FROM NLLST2 are:
```

c(1) =   0.294E+01 +/-   0.562E-01 [solar radii]
c(2) =   0.625E-01 +/-   0.542E-02 [radii/min]
c(2) =   0.724E+03 +/-   0.629E+02 [km/sec]
c(3) = -0.348E-03 +/-   0.115E-03 [radii/min**2]
c(3) = -0.135E+00 +/-   0.445E-01 [km/sec**2]

The computed ERRORS in coefficients [BEVINGTON] are:

     Approximate error in c(1) = 0.96528E-01 [radii] Bevington pg 154 (8-30)
       Exact error in c(1) = 0.37100E-01 [radii] Bevington pg 154 (8-28)
     Approximate error in c(2) = 0.83167E-02 [radii/min] Bevington pg 154 (8-30)
       Exact error in c(2) = 0.38627E-02 [radii/min] Bevington pg 154 (8-28)
     Approximate error in c(3) = 0.16149E-03 [radii/min**] Bevington pg 154 (8-30)
       Exact error in c(3) = 0.80207E-04 [radii/min**] Bevington pg 154 (8-28)

ANGULAR INFORMATION:

ANGULAR ACCELERATION= 0.0000E+00 +/- 0.0000E+00[radians/sec**2]

The computed ANGULAR coefficients and errors FROM NLLST2 are:

a(1) = 150. +/- 0. [degrees]
a(2) = 0.000E+00 +/- 0.000E+00 [degrees/min]
a(2) = 0.000E+00 +/- 0.000E+00 [rad/sec]
a(3) = 0.000E+00 +/- 0.000E+00 [degrees/min**2]
a(3) = 0.000E+00 +/- 0.000E+00 [rad/sec**2]

THE TANGENTIAL AND TOTAL VELOCITIES AT EACH DATA POINT ARE:
The TANGENTIAL velocity at 7:13 = 0. km/sec
The TOTAL velocity at 7:13 = 619. km/sec

The TANGENTIAL velocity at 7:21 = 0. km/sec
The TOTAL velocity at 7:21 = 553. km/sec

The TANGENTIAL velocity at 7:29 = 0. km/sec
The TOTAL velocity at 7:29 = 485. km/sec

The TANGENTIAL velocity at 7:37 = 0. km/sec
The TOTAL velocity at 7:37 = 418. km/sec

****
 The following info is for estimating goodness of the fit
****

Fit is ok [ier=1]

Standard Deviation in the height = 0.48
Standard Deviation in start time measurement = 0.929E+01
Value of reduced Chi Squared returned from nllst2 = 0.176E-03
Reduced Chi Squared = 0.145E-02
Chi Squared = 0.145E-02
The probability for exceeding chi square = 0.989E+00

For a second order fit 3 correlation coefficients are given:
 (Using equation of motion: r = a + bt + at**2)
The correlation between the data and the term linear in time = 0.1048E+01
 The correlation between the data and the time**2 term = 0.9563E+00
0The correlation between the data and the complete equation of motion = 0.1002E+01
 SEE BEVINGTON "Data Reduction and Error Analysis" [1969]