SMM C/P 1987 DOY311 125 +/- Ø degrees

height = h + velocity*time   # data points = 3
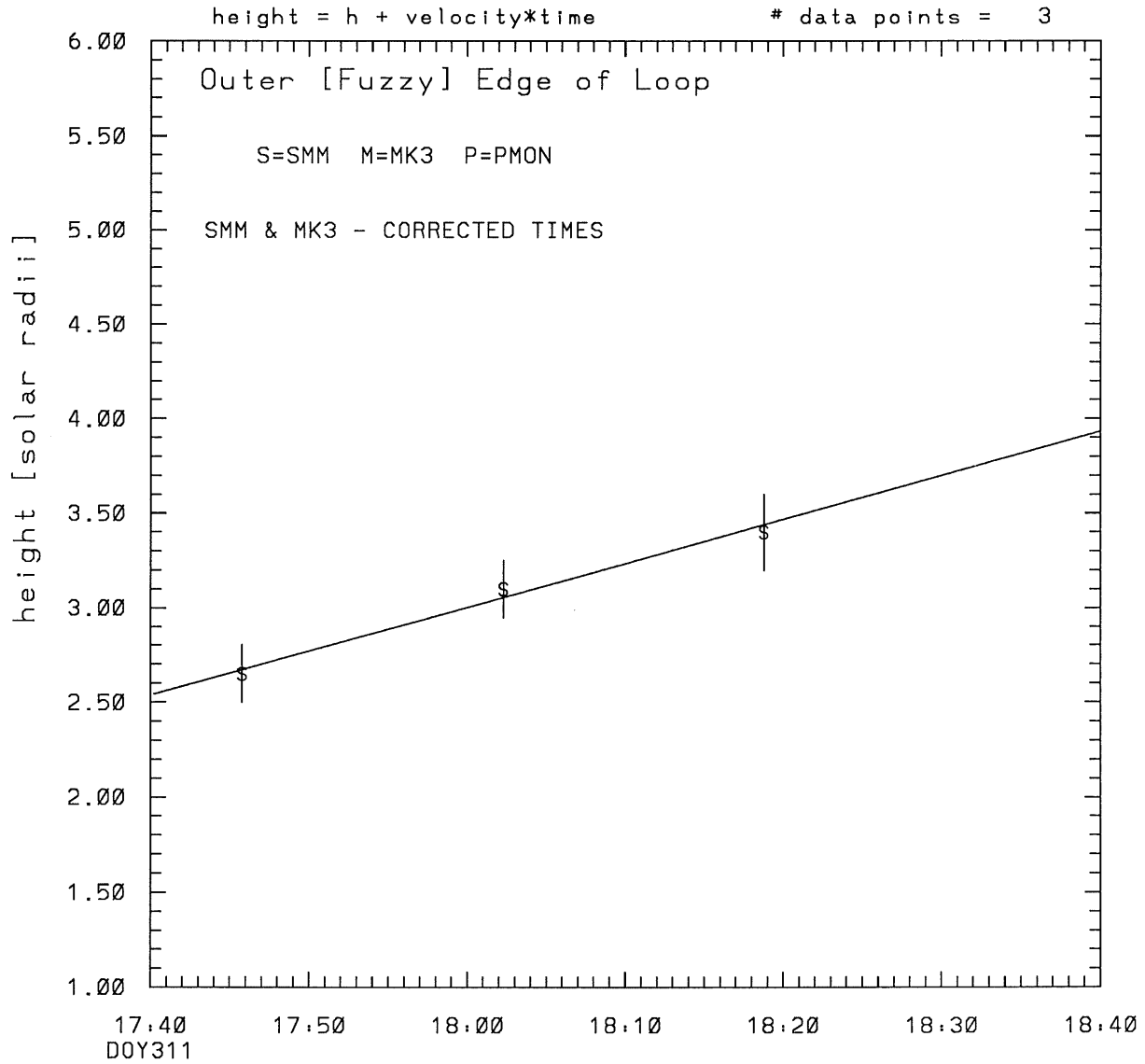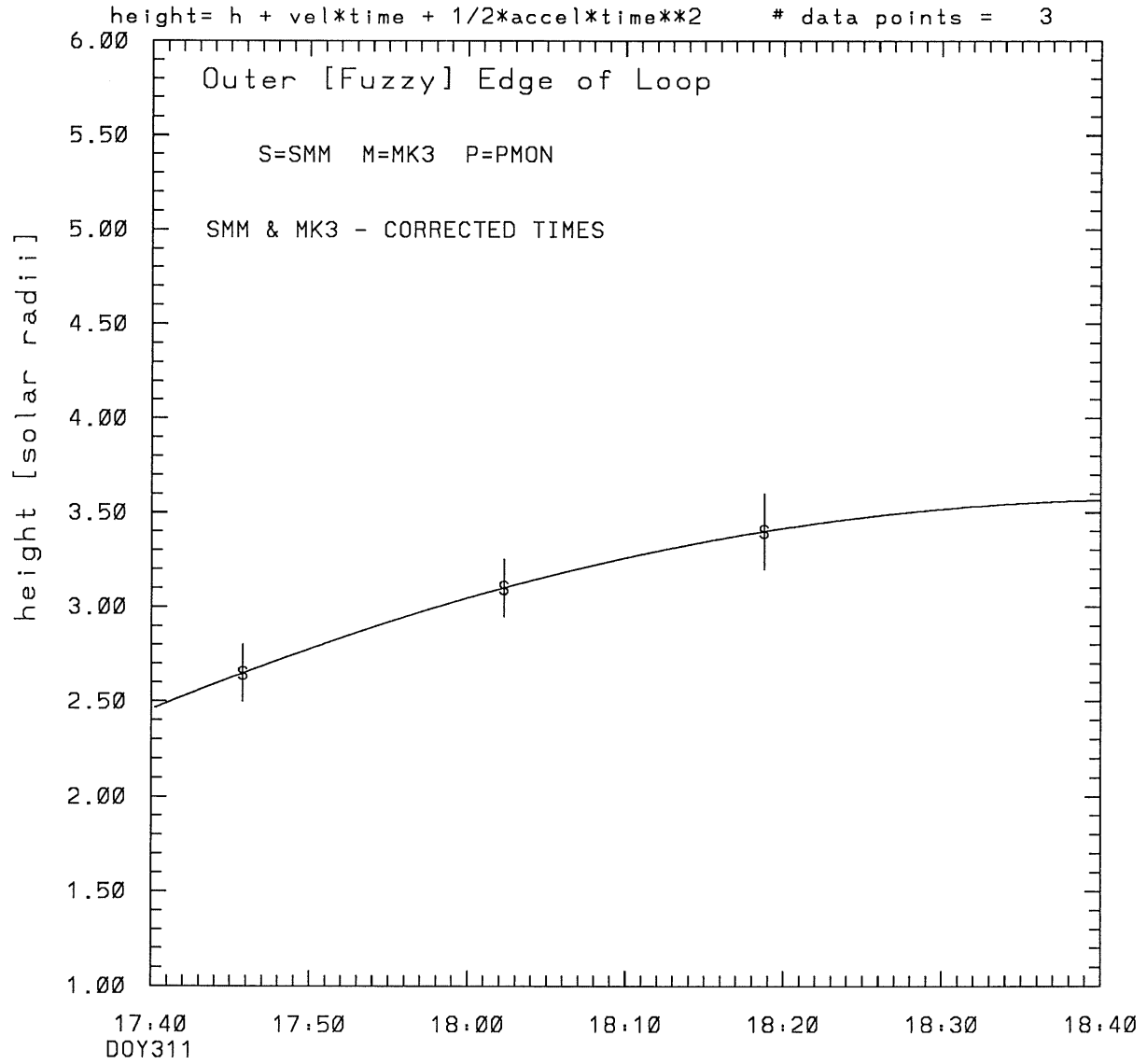
Outer [Fuzzy] Edge of Loop

S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

tstart=DOY311 16:34 +/-   3.8 [min.]
radial velocity= 270. +/- 23. [km/sec]

SMM C/P 1987 DOY311 125 +/- Ø degrees

height= h + vel*time + 1/2*accel*time**2   # data points = 3

6.00

Outer [Fuzzy] Edge of Loop

5.50

S=SMM M=MK3 P=PMON

5.00

SMM & MK3 - CORRECTED TIMES

4.50

height [solar radii]

4.00

3.50

3.00

2.50

2.00

1.50

1.00

17:40   17:50   18:00   18:10   18:20   18:30   18:40
DOY311

tstart=DOY311 17: 7 +/-   Ø.Ø [min.]

radial acceleration=-Ø.1065 +/- Ø.ØØØØ [km/sec**2]

SMM C/P 1987 DOY311 125 +/- Ø degrees

height= h + vel*time + 1/2*accel*time**2   # data points =   3

Outer [Fuzzy] Edge of Loop

SMM & MK3 - CORRECTED TIMES

radial velocity (km/sec)

420.
400.
380.
360.
340.
320.
300.
280.
260.
240.
220.
200.
180.
160.
140.
120.
100.
80.
60.
40.
20.

17:40   17:50   18:00   18:10   18:20   18:30   18:40
DOY311

tstart=DOY311 17: 7 +/-   Ø.Ø [min.]

radial acceleration=-.1Ø7E+ØØ km/sec**2

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


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


                        error in      error in
year doy    time    radii  radius     angle  angle    datatype
1987 311  17:45:47  2.65 +/- 0.15    125.0 +/- 0.5      SMM
1987 311  18: 2:17  3.10 +/- 0.15    125.0 +/- 1.0      SMM
1987 311  18:18:47  3.40 +/- 0.20    125.0 +/- 1.0      SMM


*****************************************
 Structure being measured:
Outer [Fuzzy] Edge of Loop
*****************************************


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


START TIME:


Event began at t = 0 + -0.661E+02 +/- 0.385E+01 [minutes]
In more convenient units:
Event began at DOY 311 16:34 +/- 0.385E+01 [minutes]


Origin defined at DOY311 17:40


RADIAL INFORMATION:


RADIAL VELOCITY =  270. +/-   23. km/sec


The computed RADIAL coefficients and errors FROM NLLST2 are:


c(1) =   0.254E+01 +/-   0.469E-01 [solar radii]
c(2) =   0.232E-01 +/-   0.202E-02 [radii/min]
c(2) =   0.270E+03 +/-   0.235E+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)= 0.70549E-01 [radii] see Bevington pg. 114
            error in c(2)= 0.27093E-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) = 125. +/-   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 17:45 = 0.000E+00 km/sec
The TOTAL velocity at 17:45 = 270. km/sec

The TANGENTIAL velocity at 18: 2 = 0.000E+00 km/sec
The TOTAL velocity at 18: 2 = 270. km/sec

The TANGENTIAL velocity at 18:18 = 0.000E+00 km/sec
The TOTAL velocity at 18:18 = 270. km/sec

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

Fit is ok [ier=1]

Standard Deviation in the height = 0.38
Standard Deviation in start time measurement =   0.135E+02
Error in time =   0.27193E+01 using best fit method
See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.194E-02
Reduced Chi Squared = 0.905E-02
Chi Squared = 0.905E-02
The probability for exceeding chi square = 0.965E+00

The correlation coefficient =   0.993E+00
The probability that no LINEAR correlation exists between the variables =   0.7319E-01
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]

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


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

                        error in        error in
year doy    time    radii  radius   angle  angle    datatype
1987 311  17:45:47  2.65 +/- 0.15   125.0 +/- 0.5     SMM
1987 311  18: 2:17  3.10 +/- 0.15   125.0 +/- 1.0     SMM
1987 311  18:18:47  3.40 +/- 0.20   125.0 +/- 1.0     SMM


******************************************
 Structure being measured:
Outer [Fuzzy] Edge of Loop
******************************************


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


START TIME:

Event began at t = 0 + -0.330E+02 +/-  0.000E+00 [minutes]
In more convenient units:
Event began at DOY 311 17: 7 +/-  0.000E+00 [minutes]


Origin defined at DOY311 17:40

RADIAL INFORMATION:

RADIAL ACCELERATION = -0.107E+00 +/-  0.407E-06 km/sec**2

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) =    0.246E+01 +/-   0.400E-06 [solar radii]
c(2) =    0.350E-01 +/-   0.463E-07 [radii/min]
c(2) =    0.406E+03 +/-   0.537E-03 [km/sec]
c(3) =   -0.275E-03 +/-   0.105E-08 [radii/min**2]
c(3) =   -0.107E+00 +/-   0.407E-06 [km/sec**2]

ANGULAR INFORMATION:

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

The computed ANGULAR coefficients and errors FROM NLLST2 are:

a(1) = 125. +/-   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 17:45 = 0.000E+00 km/sec
The TOTAL velocity at 17:45 = 369. km/sec

The TANGENTIAL velocity at 18: 2 = 0.000E+00 km/sec
The TOTAL velocity at 18: 2 = 264. km/sec

The TANGENTIAL velocity at 18:18 = 0.000E+00 km/sec
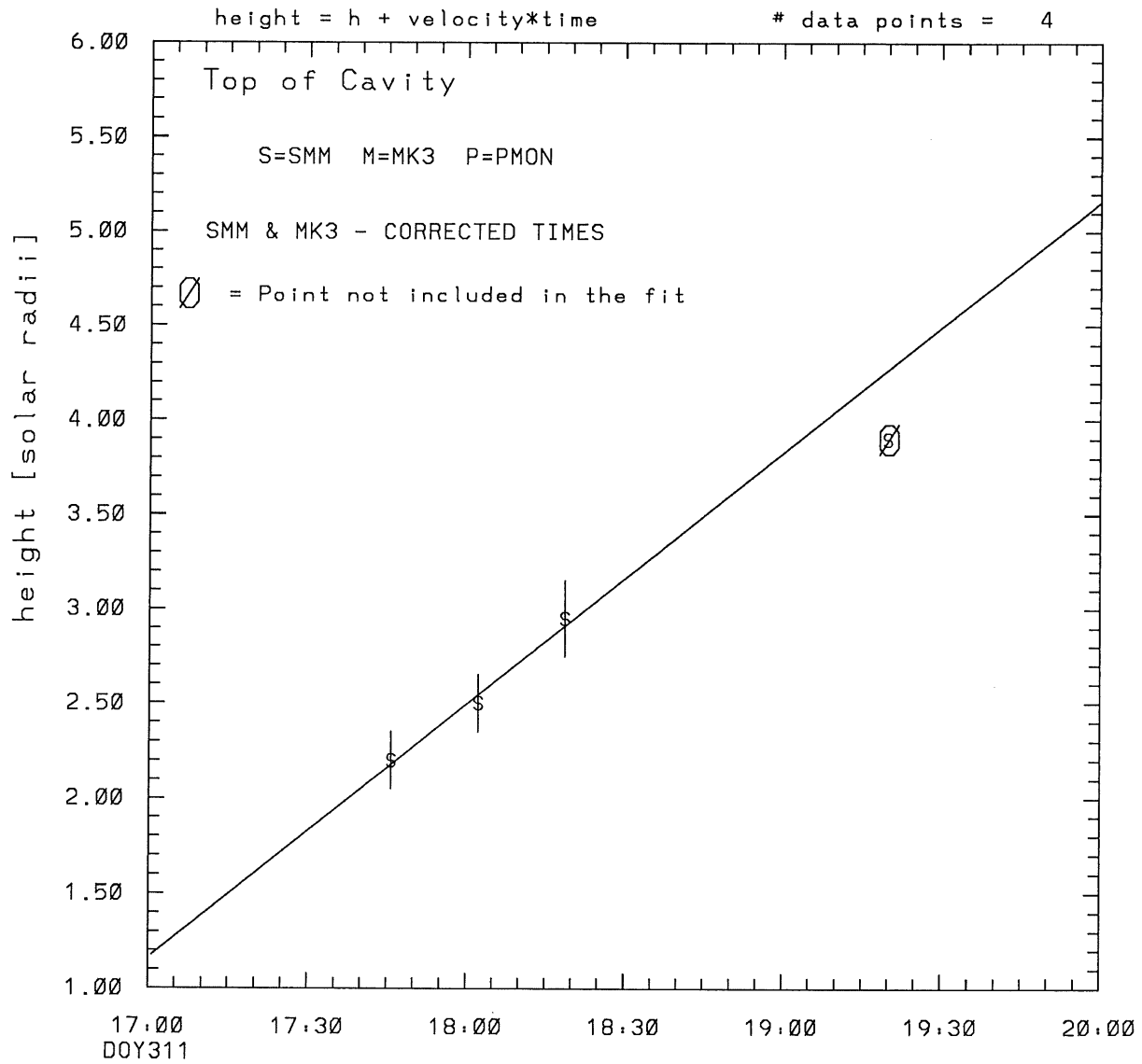The TOTAL velocity at 18:18 = 158. km/sec

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

Number data points = number of coefficients. No error analysis is possible.

Correlation coefficient is not computable!

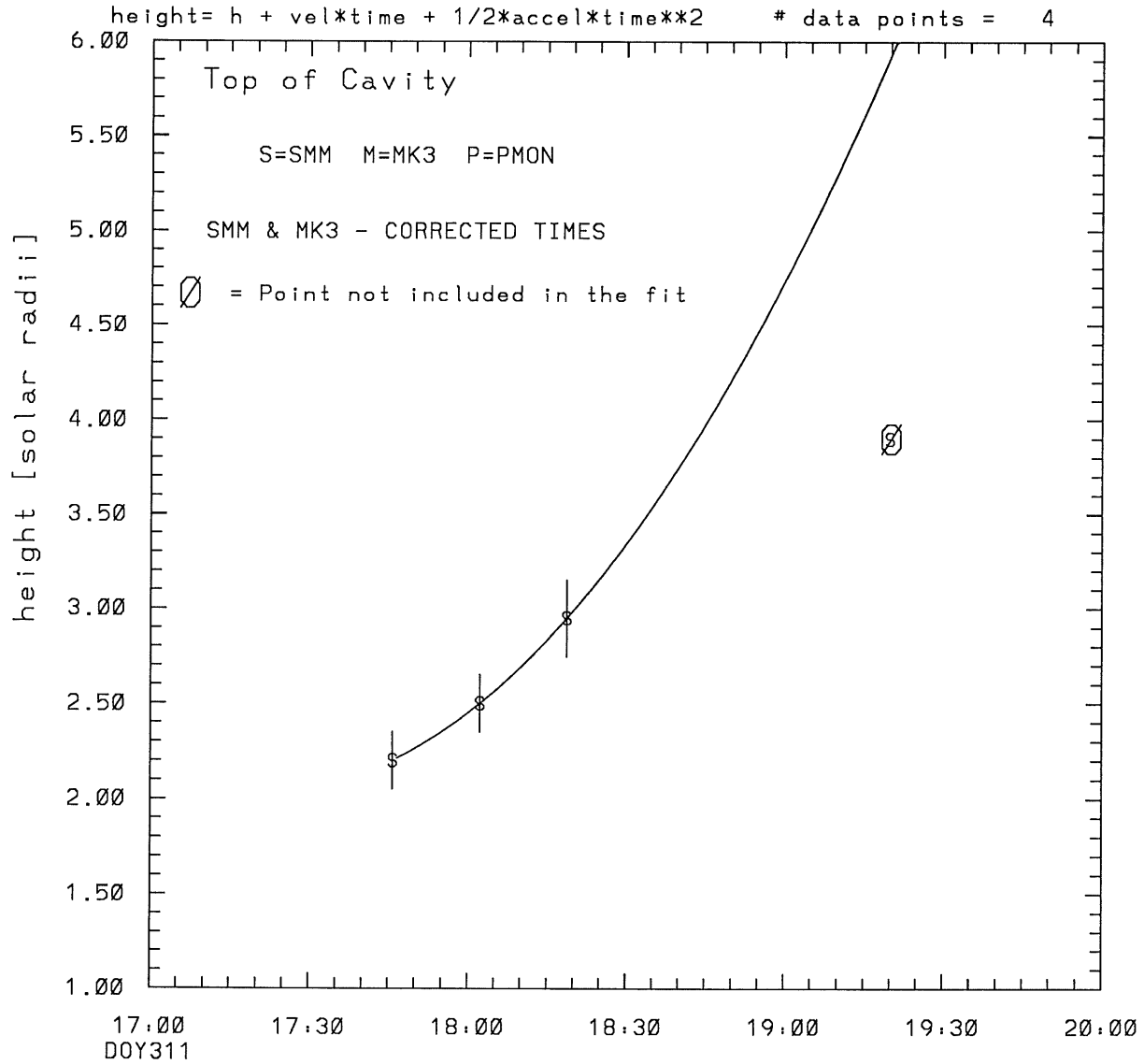# SMM C/P 1987 DOY311 125 +/- Ø degrees

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

Top of Cavity

    S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

$\emptyset$ = Point not included in the fit

height [solar radii]

tstart=DOY311 16:53 +/-   Ø.4 [min.]
radial velocity=   258. +/-   19. [km/sec]

SMM C/P 1987 DOY311 125 +/- Ø degrees

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

6.00

Top of Cavity

5.50

    S=SMM M=MK3 P=PMON

5.00

SMM & MK3 - CORRECTED TIMES

4.50

$\emptyset$ = Point not included in the fit

height [solar radii]

4.00

3.50

3.00

2.50

2.00

1.50

1.00

17:00   17:30   18:00   18:30   19:00   19:30   20:00
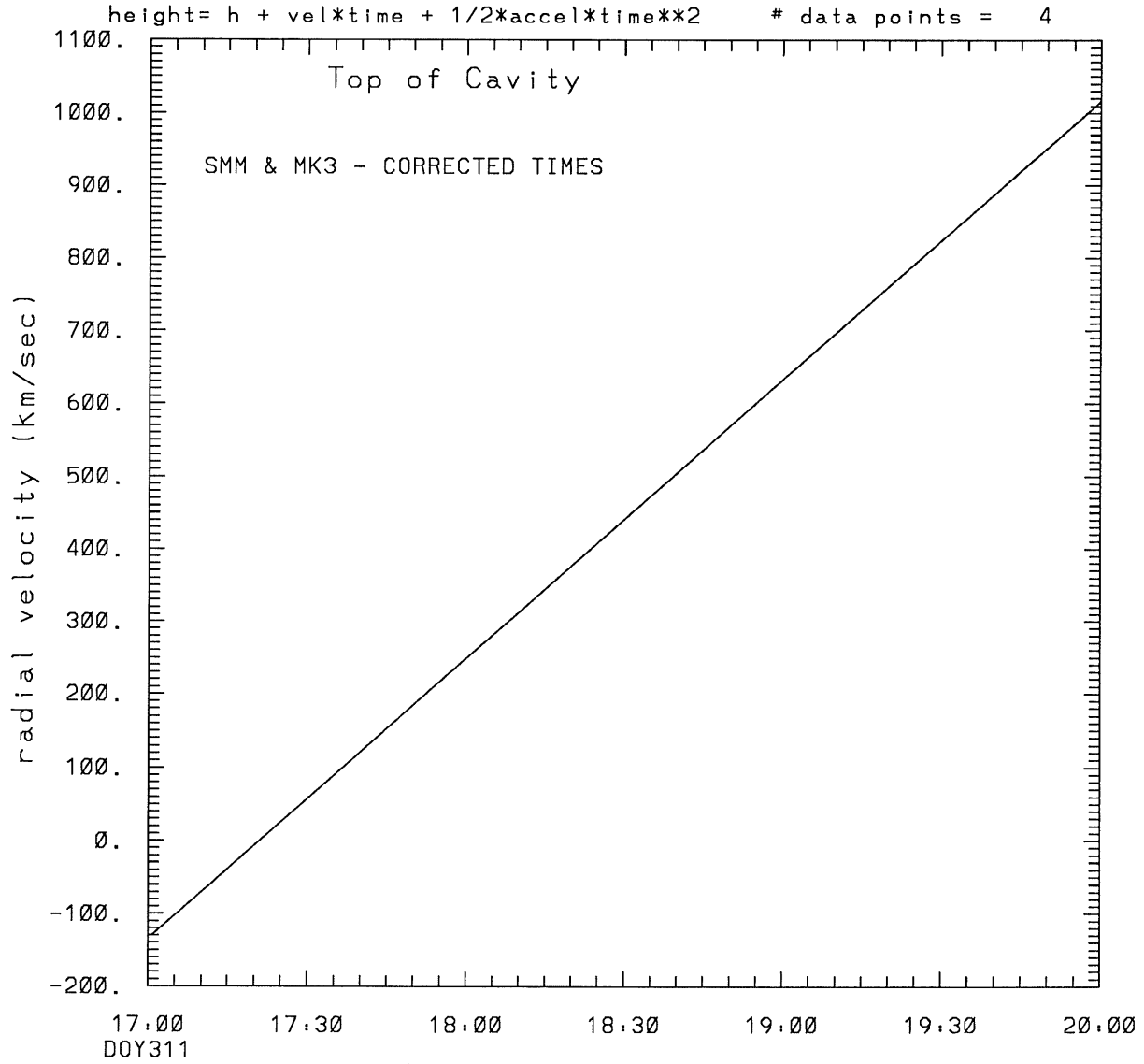DOY311

tstart=DOY311 17:21   from derivative=Ø
Event begins at   2.03 Solar Radii
radial acceleration= 0.1065 +/- 0.0000 [km/sec**2]

SMM C/P 1987 DOY311 125 +/- 0 degrees

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

Top of Cavity

SMM & MK3 - CORRECTED TIMES

radial velocity (km/sec)

1100.
1000.
900.
800.
700.
600.
500.
400.
300.
200.
100.
0.
-100.
-200.

17:00   17:30   18:00   18:30   19:00   19:30   20:00
DOY311

tstart=DOY311 17:21   from derivative=0
Event begins at   2.03 Solar Radii
radial acceleration=0.107E+00 km/sec**2

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


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


                         error in       error in
year doy    time    radii radius     angle  angle   datatype
1987 311  17:45:47  2.20 +/- 0.15    125.0 +/- 0.5      SMM
1987 311  18: 2:17  2.50 +/- 0.15    125.0 +/- 0.5      SMM
1987 311  18:18:47  2.95 +/- 0.20    125.0 +/- 0.5      SMM
1987 311  19:19:59  3.90 -----       125.00 +/- ----    SMM  THIS POINT WASN'T USED IN THE FIT.


*****************************************
 Structure being measured:
 Top of Cavity
*****************************************


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


START TIME:

Event began at t = 0 + -0.726E+01 +/- 0.435E+00 [minutes]
In more convenient units:
Event began at DOY 311 16:53 +/- 0.435E+00 [minutes]


Origin defined at DOY311 17: 0


RADIAL INFORMATION:


RADIAL VELOCITY =   258. +/-    19. km/sec


The computed RADIAL coefficients and errors FROM NLLST2 are:


c(1) =   0.116E+01 +/-   0.100E+00 [solar radii]
c(2) =   0.222E-01 +/-   0.165E-02 [radii/min]
c(2) =   0.258E+03 +/-   0.192E+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)= 0.33185E+00 [radii] see Bevington pg. 114
            error in c(2)= 0.37232E-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) = 125. +/-   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 17:45 = 0.000E+00 km/sec
The TOTAL velocity at 17:45 = 258. km/sec

The TANGENTIAL velocity at 18: 2 = 0.000E+00 km/sec
The TOTAL velocity at 18: 2 = 258. km/sec

The TANGENTIAL velocity at 18:18 = 0.000E+00 km/sec
The TOTAL velocity at 18:18 = 258. km/sec

The TANGENTIAL velocity at 19:19 = 0.000E+00 km/sec
The TOTAL velocity at 19:19 = 258. km/sec

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

Fit is ok [ier=1]

Standard Deviation in the height = 0.74
Standard Deviation in start time measurement =   0.356E+02
Error in time =   0.16888E+02 using best fit method
See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.173E-02
Reduced Chi Squared = 0.278E+00
Chi Squared = 0.556E+00
The probability for exceeding chi square = 0.998E+00

The correlation coefficient =   0.995E+00
The probability that no LINEAR correlation exists between the variables =   0.5365E-02
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]

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


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


                        error in       error in
year doy   time   radii radius   angle  angle   datatype
1987 311 17:45:47  2.20 +/- 0.15   125.0 +/-  0.5     SMM
1987 311 18: 2:17  2.50 +/- 0.15   125.0 +/-  0.5     SMM
1987 311 18:18:47  2.95 +/- 0.20   125.0 +/-  0.5     SMM
1987 311 19:19:59  3.90 -----   125.00 +/- ----    SMM  THIS POINT WASN'T USED IN THE FIT.


*****************************************
 Structure being measured:
Top of Cavity
*****************************************


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


START TIME:

 tstart=DOY311 17:21 from derivative = 0
Event begins at   2.03 Solar Radii
 Origin defined at DOY311 17: 0


RADIAL INFORMATION:

RADIAL ACCELERATION =  0.107E+00 +/-  0.706E-06 km/sec**2

The computed RADIAL coefficients and errors FROM NLLST2 are:

 c(1) =    0.215E+01 +/-   0.667E-05 [solar radii]
 c(2) =   -0.116E-01 +/-   0.225E-06 [radii/min]
 c(2) =   -0.134E+03 +/-   0.261E-02 [km/sec]
 c(3) =    0.275E-03 +/-   0.182E-08 [radii/min**2]
 c(3) =    0.107E+00 +/-   0.706E-06 [km/sec**2]

The computed ERRORS in coefficients [BEVINGTON] are:

     Approximate error in c(1) =  0.96958E+01 [radii] Bevington pg 154 (8-30)
         Exact error in c(1) =  0.00000E+00 [radii] Bevington pg 154 (8-28)
     Approximate error in c(2) =  0.23395E+00 [radii/min] Bevington pg 154 (8-30)
         Exact error in c(2) = NaN         [radii/min] Bevington pg 154 (8-28)
     Approximate error in c(3) =  0.12104E-02 [radii/min**] Bevington pg 154 (8-30)
         Exact error in c(3) = NaN          [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) = 125. +/- 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 17:45 = 0.000E+00 km/sec
The TOTAL velocity at 17:45 = 158. km/sec

The TANGENTIAL velocity at 18: 2 = 0.000E+00 km/sec
The TOTAL velocity at 18: 2 = 264. km/sec

The TANGENTIAL velocity at 18:18 = 0.000E+00 km/sec
The TOTAL velocity at 18:18 = 369. km/sec

The TANGENTIAL velocity at 19:19 = 0.000E+00 km/sec
The TOTAL velocity at 19:19 = 760. km/sec

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

Fit is ok [ier=1]

Standard Deviation in the height = 0.74
Standard Deviation in start time measurement =   0.356E+02
Value of reduced Chi Squared returned from nllst2 = 0.227E-12
Reduced Chi Squared = 0.165E+02
Chi Squared = 0.165E+02
The probability for exceeding chi square = 0.100E+01

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 =   0.7128E+00
The correlation between the data and the time**2 term =   0.6354E+00
The correlation between the data and the complete equation of motion =   0.1844E+01
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]