SMM C/P 1986 DOY195 280 +/- Ø degrees

height = h + velocity*time   # data points =   9

Top of Loop

S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

Ø = Point not included in the fit

height [solar radii]

tstart=DOY195 Ø:16 +/-   Ø.3 [min.]
radial velocity= 289. +/-   8. [km/sec]

SMM C/P 1986 DOY195 280 +/- 0 degrees

height= h + vel*time + 1/2*accel*time**2   # data points =   9

Top of Loop

S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

∅ = Point not included in the fit
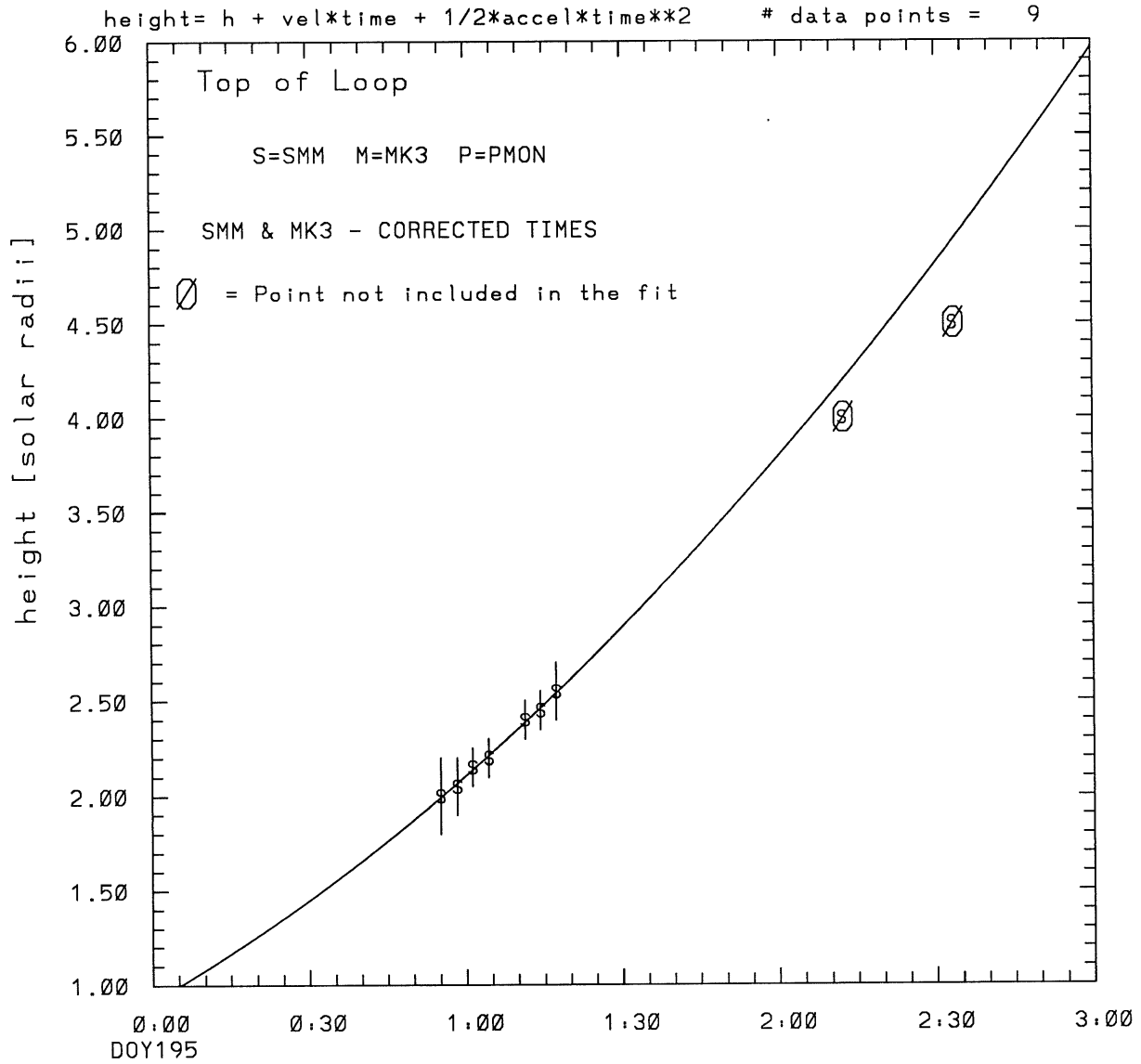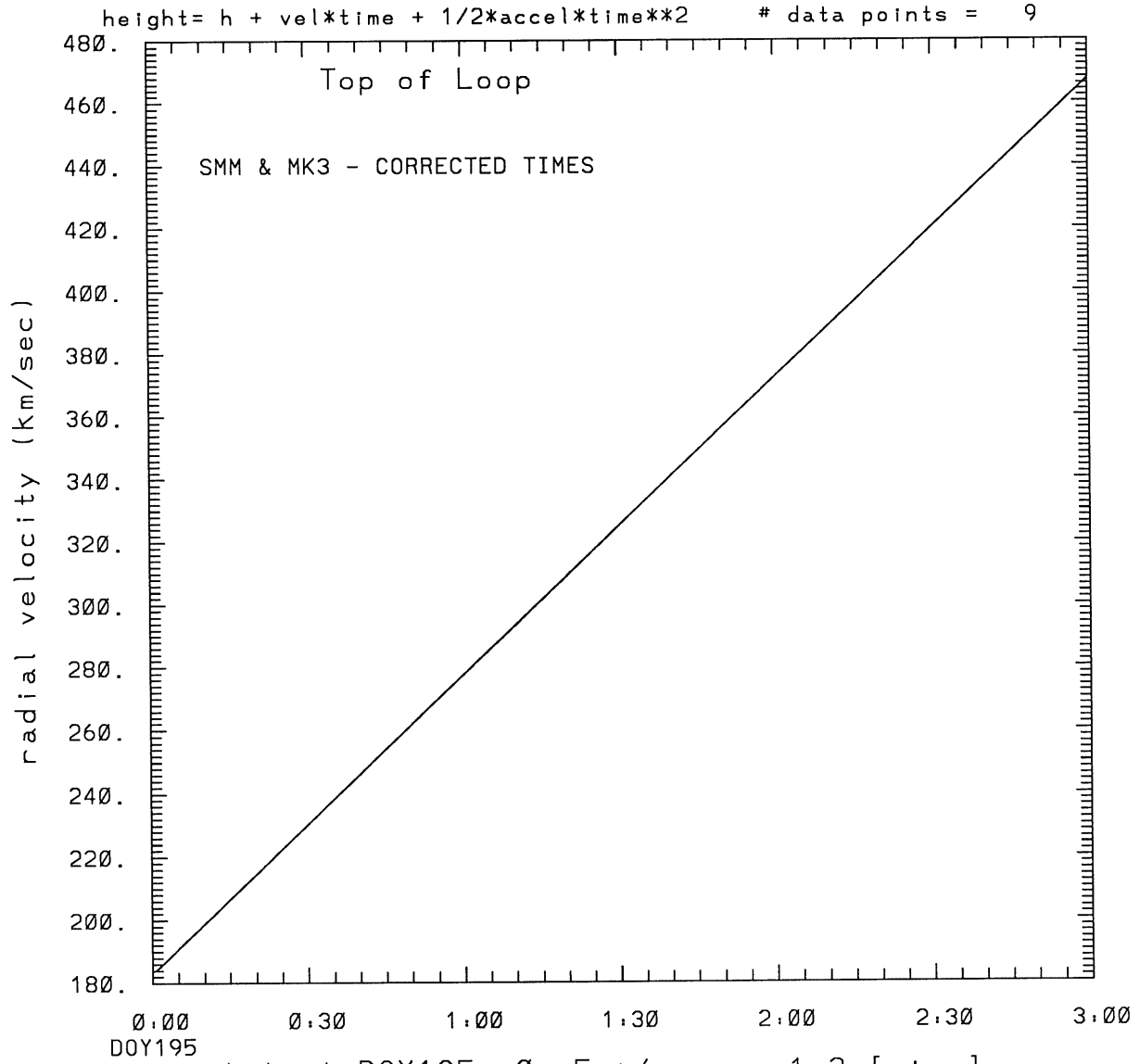
tstart=DOY195   0: 5 +/-   1.3 [min.]

radial acceleration= 0.0263 +/- 0.0522 [km/sec**2]

SMM C/P   1986 DOY195   280 +/-   0 degrees

height= h + vel*time + 1/2*accel*time**2   # data points =   9

480.

Top of Loop

460.

440.   SMM & MK3 - CORRECTED TIMES

420.

400.

380.

360.

340.

320.

300.

280.

260.

240.

220.

200.

180.

radial velocity (km/sec)

0:00   0:30   1:00   1:30   2:00   2:30   3:00
DOY195

tstart=DOY195 0: 5 +/-   1.3 [min.]

radial acceleration=0.263E-01 km/sec**2

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


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

			error in		error in		
year doy	time	radii	radius	angle	angle	datatype	
1986 195	0:55: 8	2.00 +/-	0.20	280.0 +/-	0.5	SMM	
1986 195	0:58:18	2.05 +/-	0.15	280.0 +/-	0.5	SMM	
1986 195	1: 1:14	2.15 +/-	0.10	280.0 +/-	0.5	SMM	
1986 195	1: 4:20	2.20 +/-	0.10	280.0 +/-	0.5	SMM	
1986 195	1:11:17	2.40 +/-	0.10	280.0 +/-	0.5	SMM	
1986 195	1:14:17	2.45 +/-	0.10	280.0 +/-	0.5	SMM	
1986 195	1:17:19	2.55 +/-	0.15	280.0 +/-	0.5	SMM	
1986 195	2:12:18	4.00 -----		280.00 +/-	----	SMM THIS POINT WASN'T USED IN THE FIT.	
1986 195	2:33:17	4.50 -----		280.00 +/-	----	SMM THIS POINT WASN'T USED IN THE FIT.	

```
*****************************************
 Structure being measured:
 Top of Loop
*****************************************


********
 OUTPUT:
********
```

START TIME:

Event began at t = 0 + 0.155E+02 +/- 0.330E+00 [minutes]
In more convenient units:
Event began at DOY 195 0:16 +/- 0.330E+00 [minutes]

Origin defined at DOY195 0: 0

RADIAL INFORMATION:

RADIAL VELOCITY =   289. +/-   8. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

```
c(1) =    0.614E+00 +/-    0.471E-01 [solar radii]
c(2) =    0.249E-01 +/-    0.697E-03 [radii/min]
c(2) =    0.289E+03 +/-    0.809E+01 [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)= 0.41913E-01 [radii] see Bevington pg. 114
          error in c(2)= 0.46892E-03 [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) = 280. +/-   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 0:55 = 0.000E+00 km/sec
The TOTAL velocity at 0:55 = 289. km/sec

The TANGENTIAL velocity at 0:58 = 0.000E+00 km/sec
The TOTAL velocity at 0:58 = 289. km/sec

The TANGENTIAL velocity at 1: 1 = 0.000E+00 km/sec
The TOTAL velocity at 1: 1 = 289. km/sec

The TANGENTIAL velocity at 1: 4 = 0.000E+00 km/sec
The TOTAL velocity at 1: 4 = 289. km/sec

The TANGENTIAL velocity at 1:11 = 0.000E+00 km/sec
The TOTAL velocity at 1:11 = 289. km/sec

The TANGENTIAL velocity at 1:14 = 0.000E+00 km/sec
The TOTAL velocity at 1:14 = 289. km/sec

The TANGENTIAL velocity at 1:17 = 0.000E+00 km/sec
The TOTAL velocity at 1:17 = 289. km/sec

The TANGENTIAL velocity at 2:12 = 0.000E+00 km/sec
The TOTAL velocity at 2:12 = 289. km/sec

The TANGENTIAL velocity at 2:33 = 0.000E+00 km/sec
The TOTAL velocity at 2:33 = 289. km/sec

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

Fit is ok [ier=1]

Standard Deviation in the height = 0.91
Standard Deviation in start time measurement =   0.330E+02
Error in time =   0.49410E+01 using best fit method
See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.194E-03
Reduced Chi Squared = 0.173E-01
Chi Squared = 0.121E+00
The probability for exceeding chi square = 0.100E+01

The correlation coefficient =   0.100E+01
The probability that no LINEAR correlation exists between the variables = -0.5055E-10
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
1986 195	0:55: 8	2.00 +/- 0.20		280.0 +/- 0.5		SMM
1986 195	0:58:18	2.05 +/- 0.15		280.0 +/- 0.5		SMM
1986 195	1: 1:14	2.15 +/- 0.10		280.0 +/- 0.5		SMM
1986 195	1: 4:20	2.20 +/- 0.10		280.0 +/- 0.5		SMM
1986 195	1:11:17	2.40 +/- 0.10		280.0 +/- 0.5		SMM
1986 195	1:14:17	2.45 +/- 0.10		280.0 +/- 0.5		SMM
1986 195	1:17:19	2.55 +/- 0.15		280.0 +/- 0.5		SMM
1986 195	2:12:18	4.00 -----		280.00 +/- ----		SMM THIS POINT WASN'T USED IN THE FIT.
1986 195	2:33:17	4.50 -----		280.00 +/- ----		SMM THIS POINT WASN'T USED IN THE FIT.

```
*****************************************
Structure being measured:
Top of Loop
*****************************************


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


START TIME:
```

Event began at t = 0 + 0.520E+01 +/- 0.126E+01 [minutes]
In more convenient units:
Event began at DOY 195 0: 5 +/- 0.126E+01 [minutes]

Origin defined at DOY195 0: 0

RADIAL INFORMATION:

RADIAL ACCELERATION = 0.263E-01 +/- 0.522E-01 km/sec**2

The computed RADIAL coefficients and errors FROM NLLST2 are:

$c(1)$ = 0.916E+00 +/- 0.602E+00 [solar radii]
$c(2)$ = 0.158E-01 +/- 0.181E-01 [radii/min]
$c(2)$ = 0.183E+03 +/- 0.210E+03 [km/sec]
$c(3)$ = 0.681E-04 +/- 0.135E-03 [radii/min**2]
$c(3)$ = 0.263E-01 +/- 0.522E-01 [km/sec**2]

The computed ERRORS in coefficients [BEVINGTON] are:

Approximate error in $c(1)$ = 0.94146E+00 [radii] Bevington pg 154 (8-30)
Exact error in $c(1)$ = 0.61872E-01 [radii] Bevington pg 154 (8-28)

Approximate error in c(2) = 0.20833E-01 [radii/min] Bevington pg 154 (8-30)
    Exact error in c(2) = 0.18461E-02 [radii/min] Bevington pg 154 (8-28)
Approximate error in c(3) = 0.99817E-04 [radii/min**] Bevington pg 154 (8-30)
    Exact error in c(3) = 0.13639E-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) = 280. +/- 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 0:55 = 0.000E+00 km/sec
The TOTAL velocity at 0:55 = 270. km/sec

The TANGENTIAL velocity at 0:58 = 0.000E+00 km/sec
The TOTAL velocity at 0:58 = 275. km/sec

The TANGENTIAL velocity at 1: 1 = 0.000E+00 km/sec
The TOTAL velocity at 1: 1 = 280. km/sec

The TANGENTIAL velocity at 1: 4 = 0.000E+00 km/sec
The TOTAL velocity at 1: 4 = 285. km/sec

The TANGENTIAL velocity at 1:11 = 0.000E+00 km/sec
The TOTAL velocity at 1:11 = 295. km/sec

The TANGENTIAL velocity at 1:14 = 0.000E+00 km/sec
The TOTAL velocity at 1:14 = 300. km/sec

The TANGENTIAL velocity at 1:17 = 0.000E+00 km/sec
The TOTAL velocity at 1:17 = 305. km/sec

The TANGENTIAL velocity at 2:12 = 0.000E+00 km/sec
The TOTAL velocity at 2:12 = 392. km/sec

The TANGENTIAL velocity at 2:33 = 0.000E+00 km/sec
The TOTAL velocity at 2:33 = 425. km/sec

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

 Fit is ok [ier=1]

Standard Deviation in the height = 0.91
Standard Deviation in start time measurement = 0.330E+02
Value of reduced Chi Squared returned from nllst2 = 0.214E-03
Reduced Chi Squared = 0.332E+00
Chi Squared = 0.199E+01
The probability for exceeding chi square = 0.100E+01

For a second order fit 3 correlation coefficients are given:
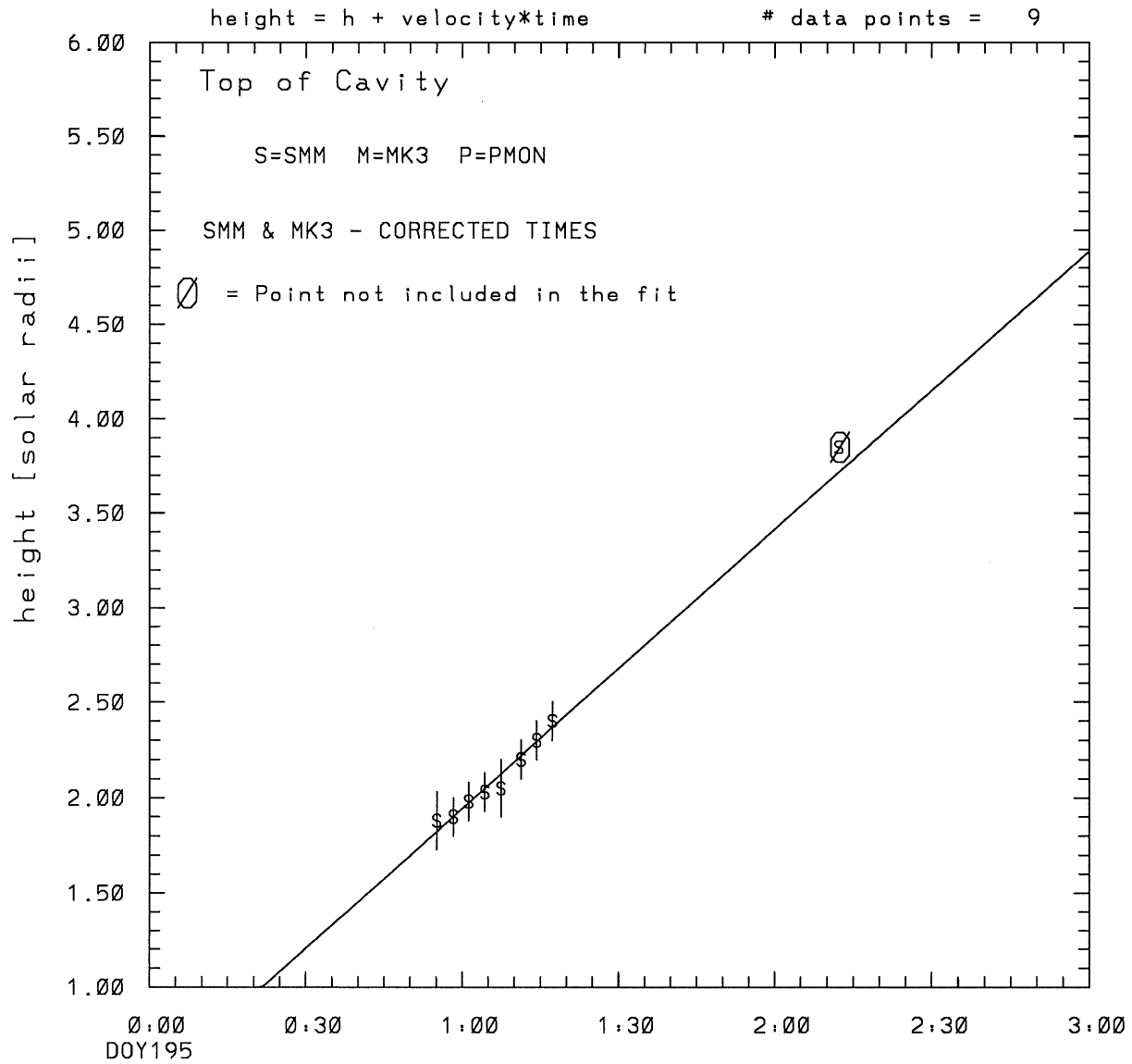 (Using equation of motion: r = a + bt + at**2)
The correlation between the data and the term linear in time = 0.5208E+00
The correlation between the data and the time**2 term = 0.5101E+00
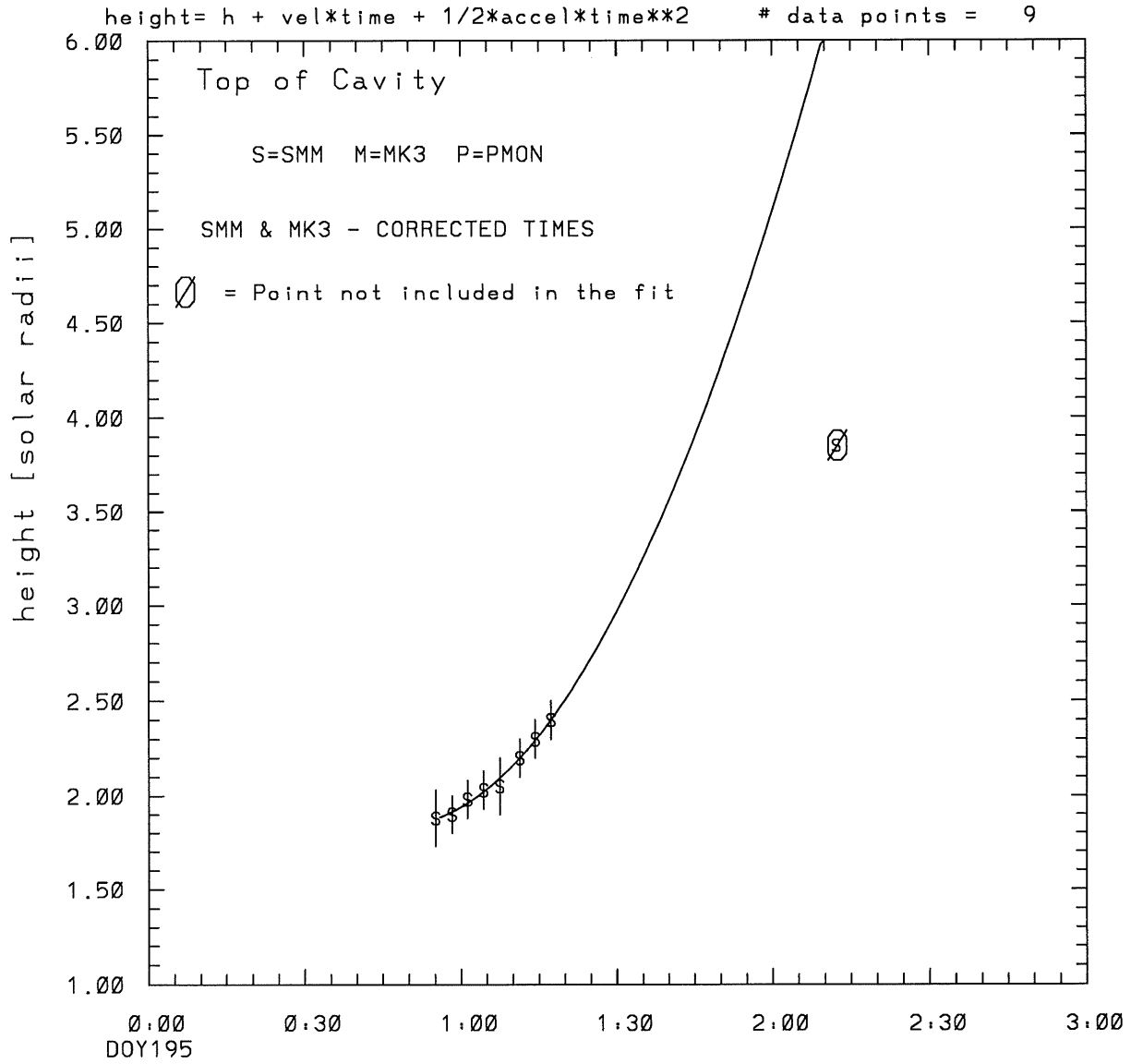The correlation between the data and the complete equation of motion = 0.1144E+01
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]
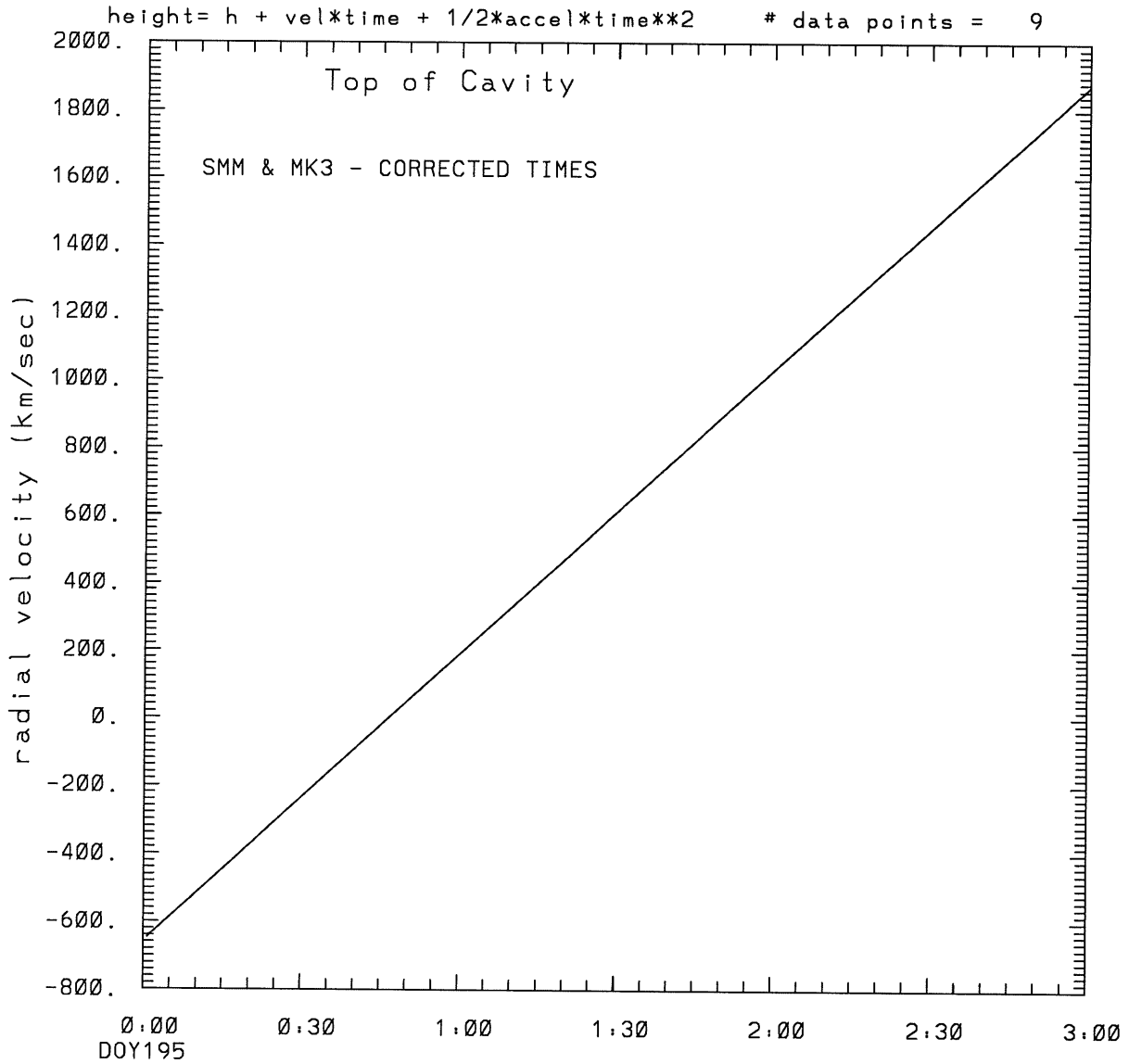
SMM C/P 1986 DOY195 280 +/- Ø degrees

height = h + velocity*time   # data points = 9

Top of Cavity

S=SMM M=MK3 P=PMON

SMM & MK3 - CORRECTED TIMES

∅ = Point not included in the fit

height [solar radii]

DOY195

tstart=DOY195 Ø:22 +/-   Ø.4 [min.]
radial velocity= 285. +/- 17. [km/sec]

SMM C/P 1986 DOY195 280 +/- 0 degrees

height= h + vel*time + 1/2*accel*time**2   # data points =   9

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

4.00

height [solar radii]

3.50

3.00

2.50

2.00

1.50

1.00

0:00   0:30   1:00   1:30   2:00   2:30   3:00
DOY195

tstart=DOY195 0:46   from derivative=0
Event begins at   1.83 Solar Radii
radial acceleration= 0.2344 +/- 0.0532 [km/sec**2]

SMM C/P 1986 DOY195 280 +/- 0 degrees

height= h + vel*time + 1/2*accel*time**2   # data points = 9

Top of Cavity

SMM & MK3 - CORRECTED TIMES

radial velocity (km/sec)

2000.
1800.
1600.
1400.
1200.
1000.
800.
600.
400.
200.
0.
-200.
-400.
-600.
-800.

0:00   0:30   1:00   1:30   2:00   2:30   3:00
DOY195

tstart=DOY195 0:46   from derivative=0
Event begins at   1.83 Solar Radii
radial acceleration=0.234E+00 km/sec**2

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


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

			error in		error in		
year	doy	time	radii	radius	angle	angle	datatype
1986	195	0:55: 8	1.88 +/- 0.15		280.0 +/- 0.5		SMM
1986	195	0:58:18	1.90 +/- 0.10		280.0 +/- 0.5		SMM
1986	195	1: 1:14	1.98 +/- 0.10		280.0 +/- 0.5		SMM
1986	195	1: 4:20	2.03 +/- 0.10		280.0 +/- 0.5		SMM
1986	195	1: 7:27	2.05 +/- 0.15		280.0 +/- 0.5		SMM
1986	195	1:11:17	2.20 +/- 0.10		280.0 +/- 0.5		SMM
1986	195	1:14:17	2.30 +/- 0.10		280.0 +/- 0.5		SMM
1986	195	1:17:19	2.40 +/- 0.10		280.0 +/- 0.5		SMM
1986	195	2:12:18	3.85 -----		280.00 +/- ----		SMM THIS POINT WASN'T USED IN THE FIT.

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


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


START TIME:

Event began at t = 0 +  0.216E+02 +/-  0.419E+00 [minutes]
In more convenient units:
Event began at DOY 195  0:22 +/-  0.419E+00 [minutes]

Origin defined at DOY195  0: 0

RADIAL INFORMATION:

RADIAL VELOCITY =   285. +/-    17. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) =    0.469E+00 +/-   0.965E-01 [solar radii]
c(2) =    0.246E-01 +/-   0.143E-02 [radii/min]
c(2) =    0.285E+03 +/-   0.166E+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)= 0.74377E-01 [radii] see Bevington pg. 114
            error in c(2)= 0.96962E-03 [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) = 280. +/- 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 0:55 = 0.000E+00 km/sec
The TOTAL velocity at 0:55 = 285. km/sec

The TANGENTIAL velocity at 0:58 = 0.000E+00 km/sec
The TOTAL velocity at 0:58 = 285. km/sec

The TANGENTIAL velocity at 1: 1 = 0.000E+00 km/sec
The TOTAL velocity at 1: 1 = 285. km/sec

The TANGENTIAL velocity at 1: 4 = 0.000E+00 km/sec
The TOTAL velocity at 1: 4 = 285. km/sec

The TANGENTIAL velocity at 1: 7 = 0.000E+00 km/sec
The TOTAL velocity at 1: 7 = 285. km/sec

The TANGENTIAL velocity at 1:11 = 0.000E+00 km/sec
The TOTAL velocity at 1:11 = 285. km/sec

The TANGENTIAL velocity at 1:14 = 0.000E+00 km/sec
The TOTAL velocity at 1:14 = 285. km/sec

The TANGENTIAL velocity at 1:17 = 0.000E+00 km/sec
The TOTAL velocity at 1:17 = 285. km/sec

The TANGENTIAL velocity at 2:12 = 0.000E+00 km/sec
The TOTAL velocity at 2:12 = 285. km/sec

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

Fit is ok [ier=1]

Standard Deviation in the height = 0.61
Standard Deviation in start time measurement = 0.219E+02
Error in time = 0.68657E+01 using best fit method
See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.956E-03
Reduced Chi Squared = 0.289E-01
Chi Squared = 0.203E+00
The probability for exceeding chi square = 0.100E+01

The correlation coefficient =   0.998E+00
The probability that no LINEAR correlation exists between the variables =   0.1889E-08
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
 1986 195   0:55: 8   1.88 +/- 0.15   280.0 +/-  0.5     SMM
 1986 195   0:58:18   1.90 +/- 0.10   280.0 +/-  0.5     SMM
 1986 195   1: 1:14   1.98 +/- 0.10   280.0 +/-  0.5     SMM
 1986 195   1: 4:20   2.03 +/- 0.10   280.0 +/-  0.5     SMM
 1986 195   1: 7:27   2.05 +/- 0.15   280.0 +/-  0.5     SMM
 1986 195   1:11:17   2.20 +/- 0.10   280.0 +/-  0.5     SMM
 1986 195   1:14:17   2.30 +/- 0.10   280.0 +/-  0.5     SMM
 1986 195   1:17:19   2.40 +/- 0.10   280.0 +/-  0.5     SMM
 1986 195   2:12:18   3.85 -----  280.00 +/- ----    SMM  THIS POINT WASN'T USED IN THE FIT.


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


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


START TIME:


tstart=DOY195  0:46 from derivative = 0
Event begins at   1.83 Solar Radii
 Origin defined at DOY195  0: 0


RADIAL INFORMATION:


RADIAL ACCELERATION =  0.234E+00 +/-  0.532E-01 km/sec**2


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

$c(1) = \quad 0.316E{+}01 \ +/- \quad 0.612E{+}00$ [solar radii]
$c(2) = \quad -0.566E{-}01 \ +/- \quad 0.184E{-}01$ [radii/min]
$c(2) = \quad -0.657E{+}03 \ +/- \quad 0.214E{+}03$ [km/sec]
$c(3) = \quad 0.606E{-}03 \ +/- \quad 0.138E{-}03$ [radii/min**2]
$c(3) = \quad 0.234E{+}00 \ +/- \quad 0.532E{-}01$ [km/sec**2]

The computed ERRORS in coefficients [BEVINGTON] are:

```
     Approximate error in c(1) =  0.63941E+01 [radii] Bevington pg 154 (8-30)
         Exact error in c(1) =  0.29776E-01 [radii] Bevington pg 154 (8-28)
     Approximate error in c(2) =  0.14792E+00 [radii/min] Bevington pg 154 (8-30)
         Exact error in c(2) =  0.86100E-03 [radii/min] Bevington pg 154 (8-28)
```

Approximate error in c(3) = 0.76968E-03 [radii/min**] Bevington pg 154 (8-30)
Exact error in c(3) = 0.62321E-05 [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) = 280. +/- 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 0:55 = 0.000E+00 km/sec
The TOTAL velocity at 0:55 = 119. km/sec

The TANGENTIAL velocity at 0:58 = 0.000E+00 km/sec
The TOTAL velocity at 0:58 = 163. km/sec

The TANGENTIAL velocity at 1: 1 = 0.000E+00 km/sec
The TOTAL velocity at 1: 1 = 204. km/sec

The TANGENTIAL velocity at 1: 4 = 0.000E+00 km/sec
The TOTAL velocity at 1: 4 = 248. km/sec

The TANGENTIAL velocity at 1: 7 = 0.000E+00 km/sec
The TOTAL velocity at 1: 7 = 292. km/sec

The TANGENTIAL velocity at 1:11 = 0.000E+00 km/sec
The TOTAL velocity at 1:11 = 346. km/sec

The TANGENTIAL velocity at 1:14 = 0.000E+00 km/sec
The TOTAL velocity at 1:14 = 388. km/sec

The TANGENTIAL velocity at 1:17 = 0.000E+00 km/sec
The TOTAL velocity at 1:17 = 431. km/sec

The TANGENTIAL velocity at 2:12 = 0.000E+00 km/sec
The TOTAL velocity at 2:12 = 1204. km/sec

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

Fit is ok [ier=1]

Standard Deviation in the height = 0.61
Standard Deviation in start time measurement =   0.219E+02

Value of reduced Chi Squared returned from nllst2 = 0.289E-03
Reduced Chi Squared = 0.882E+01
Chi Squared = 0.529E+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 =   0.4412E+00
The correlation between the data and the time^{2} term =   0.3866E+00
The correlation between the data and the complete equation of motion =   0.1756E+01
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]