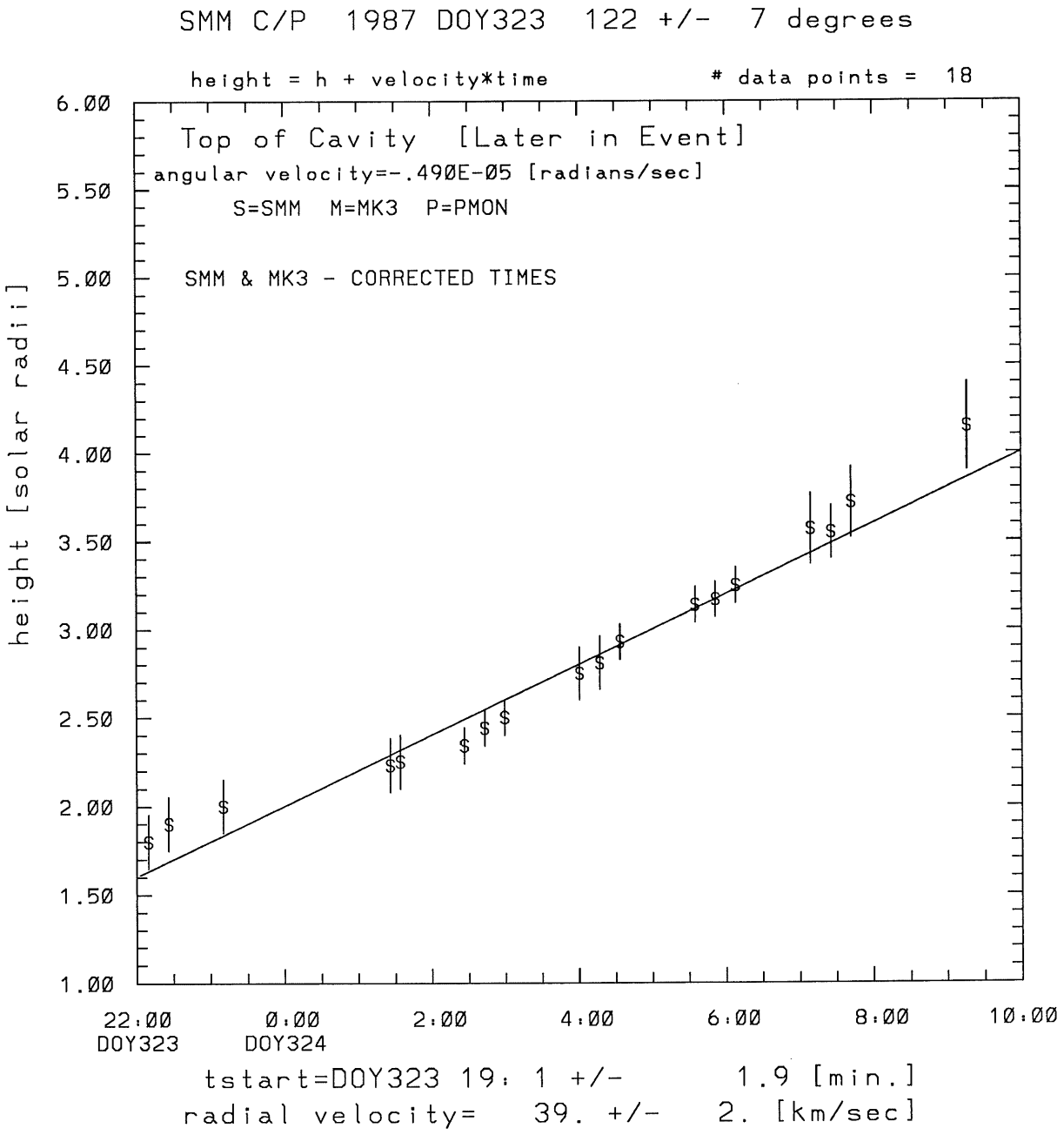
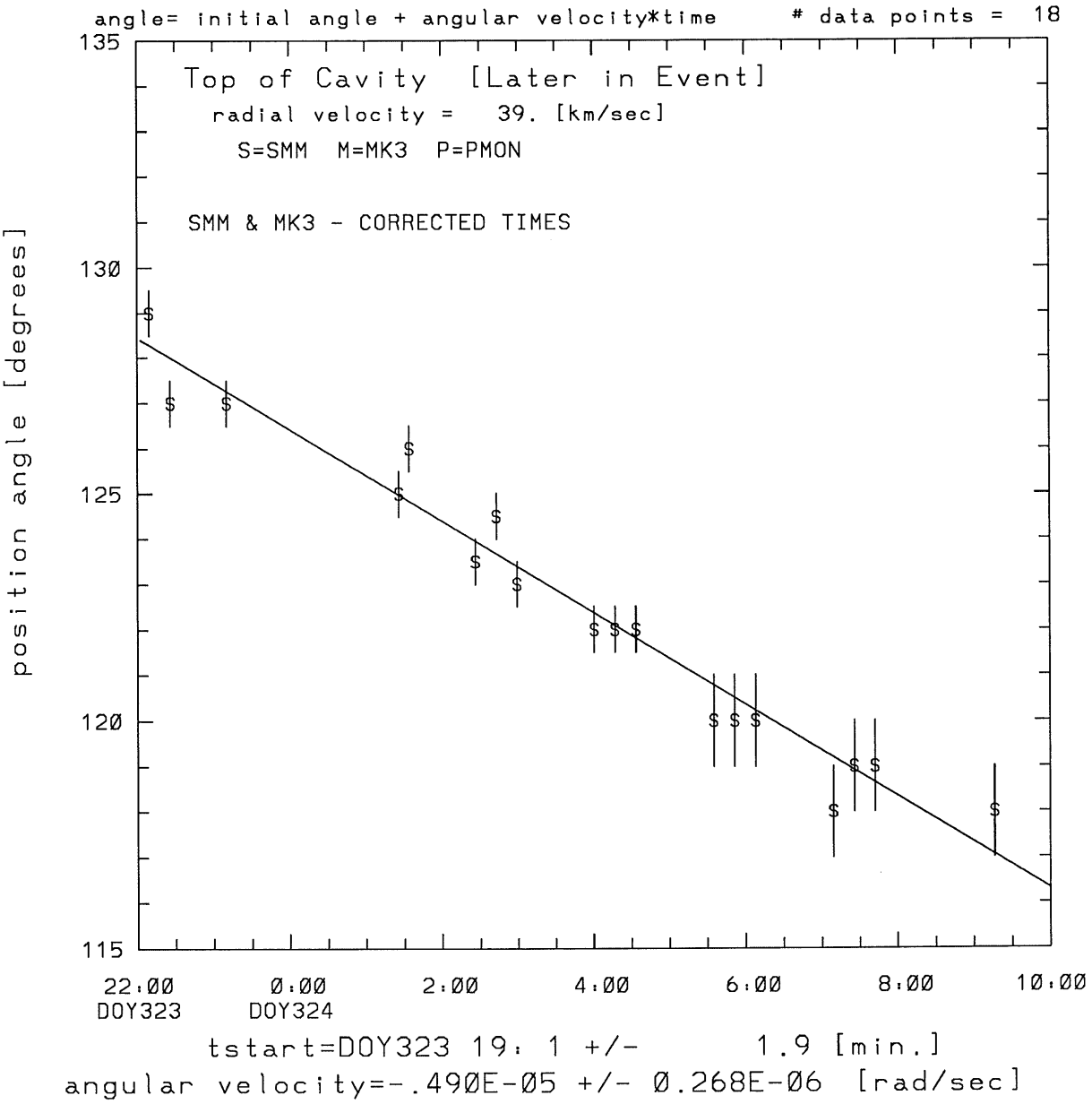

SMM C/P 1987 DOY323 122 +/- 7 degrees
height = h + velocity*time
# data points = 18
Top of Cavity [Later in Event]
angular velocity=-.490E-05 [radians/sec]
S=SMM M=MK3 P=PMON
SMM & MK3 - CORRECTED TIMES
height [solar radii]
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
22:00
DOY323
0:00
DOY324
2:00
4:00
6:00
8:00
10:00
tstart=DOY323 19: 1 +/- 1.9 [min.]
radial velocity= 39. +/- 2. [km/sec]

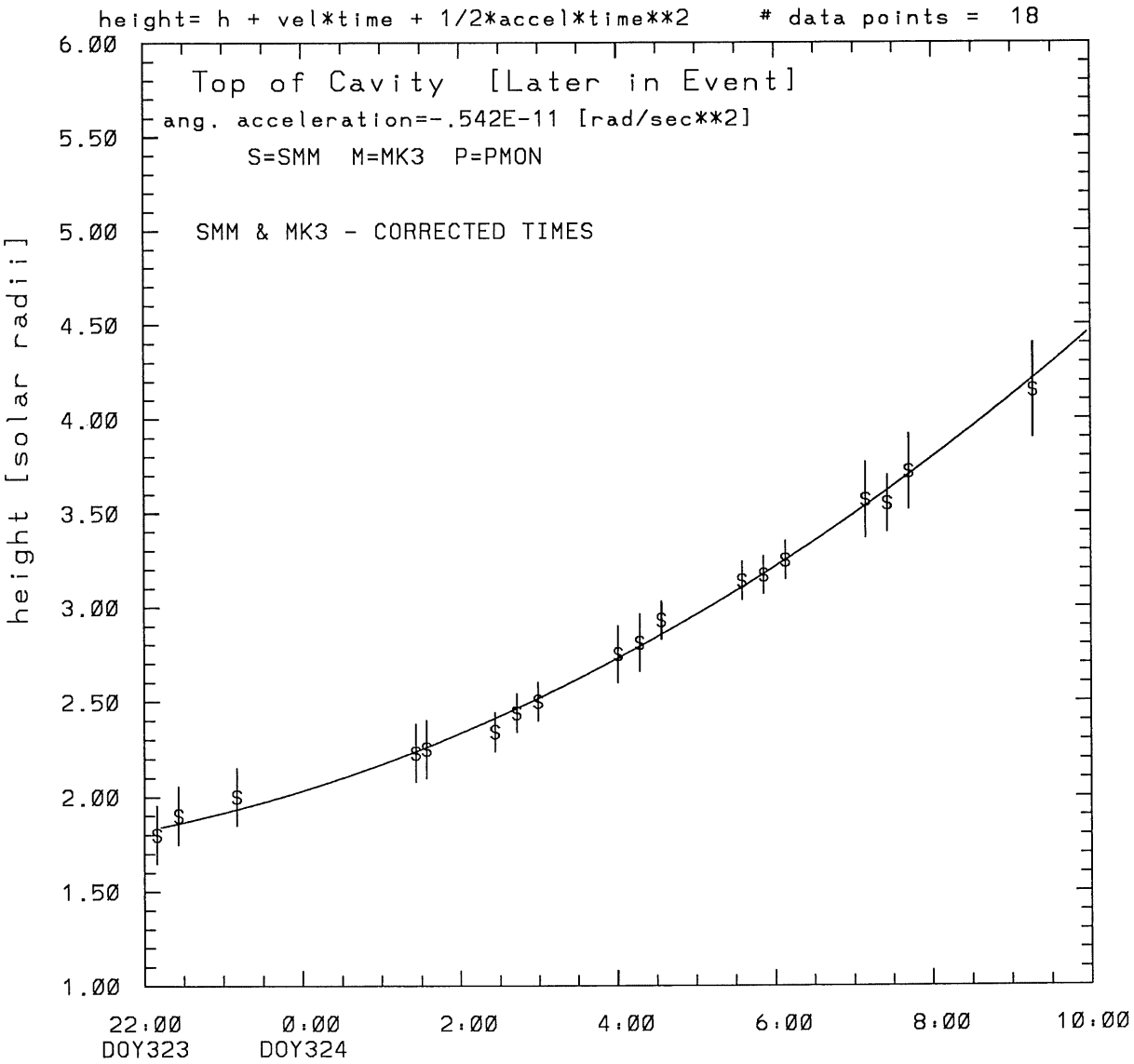
SMM C/P 1987 DOY323 122 +/- 7 degrees




tstart=DOY323 19: 1 +/- 1.9 [min.]

angular velocity=-.490E-05 +/- 0.268E-06 [rad/sec]

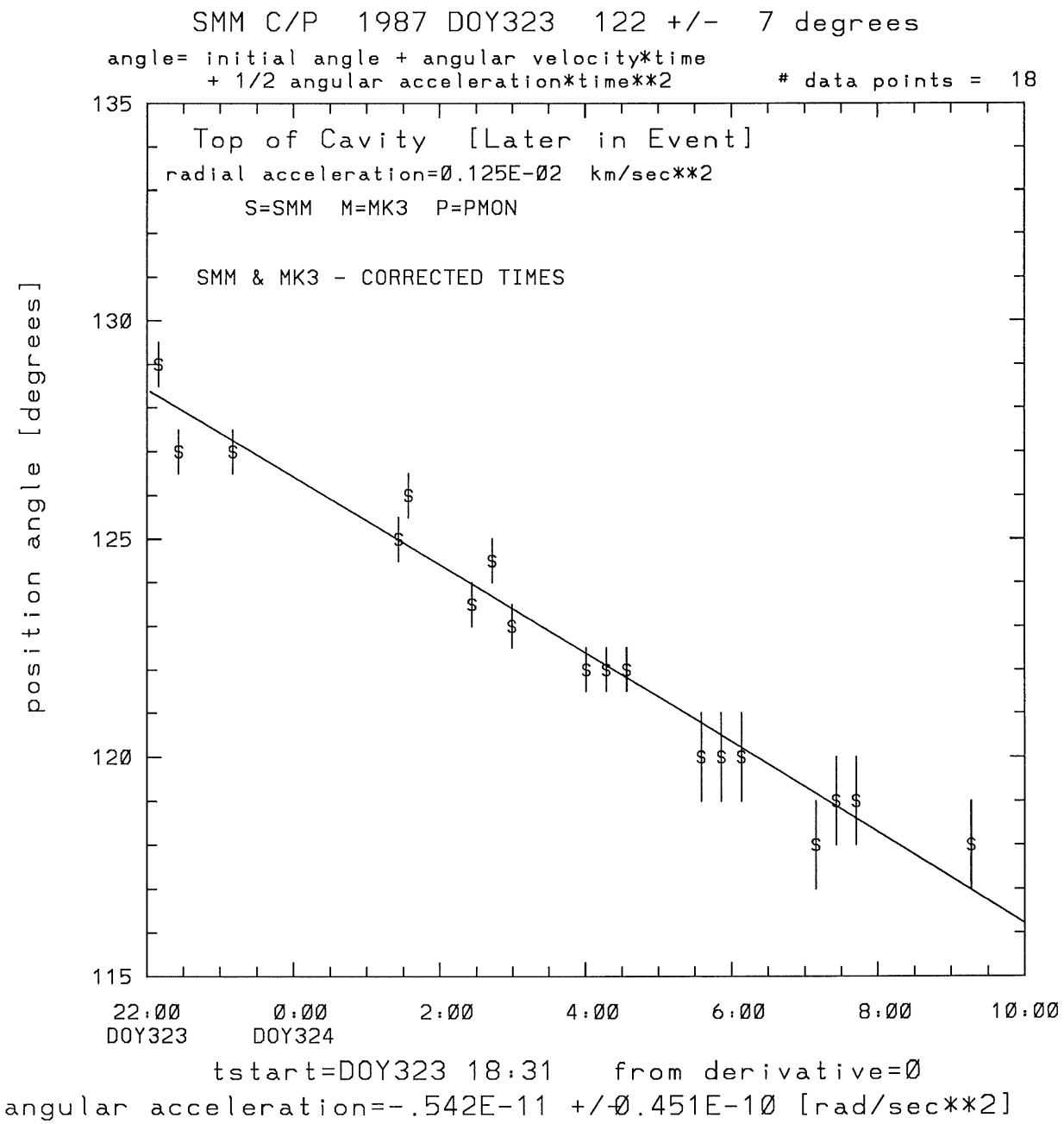
SMM C/P 1987 DOY323 122 +/- 7 degrees

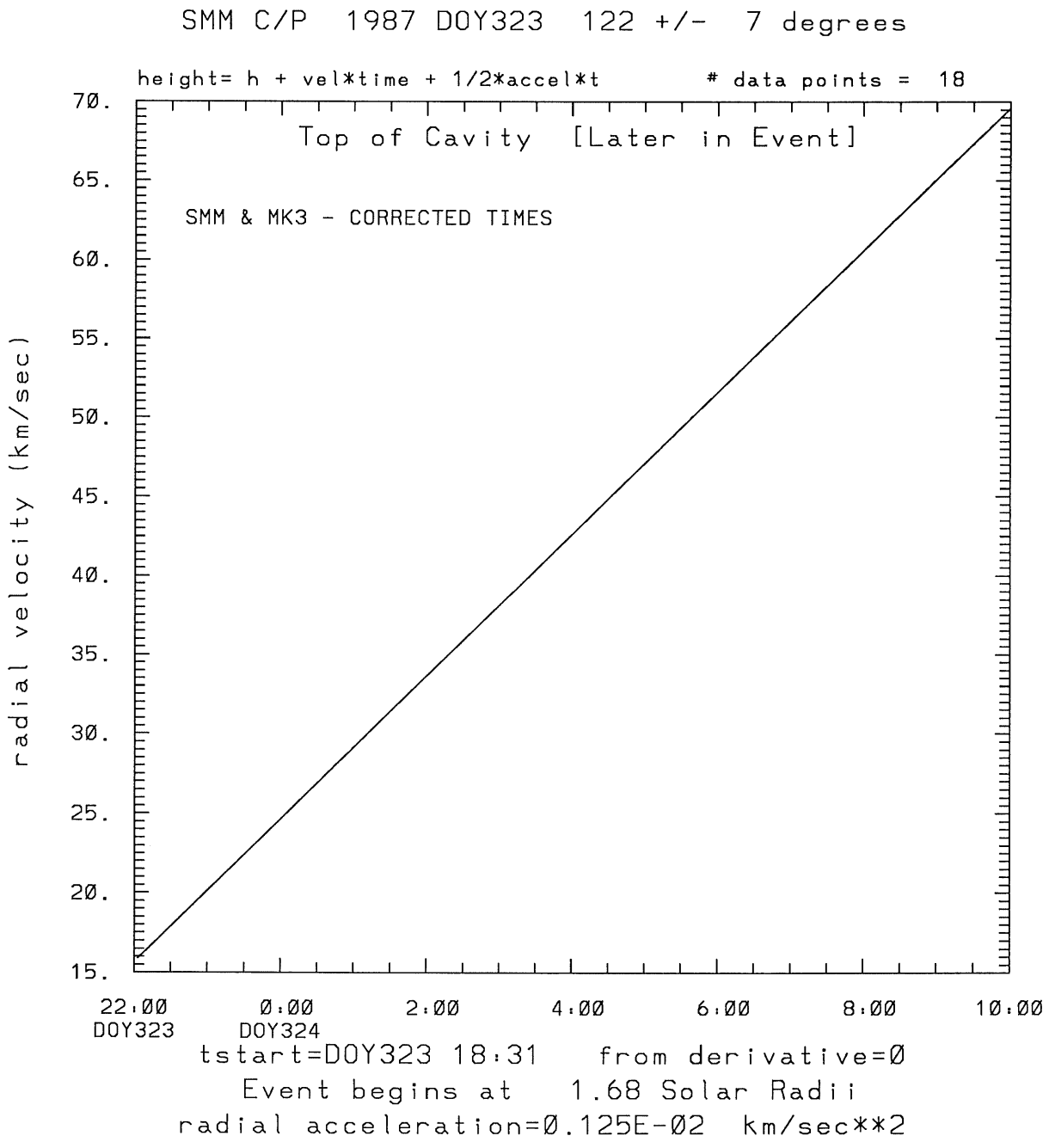


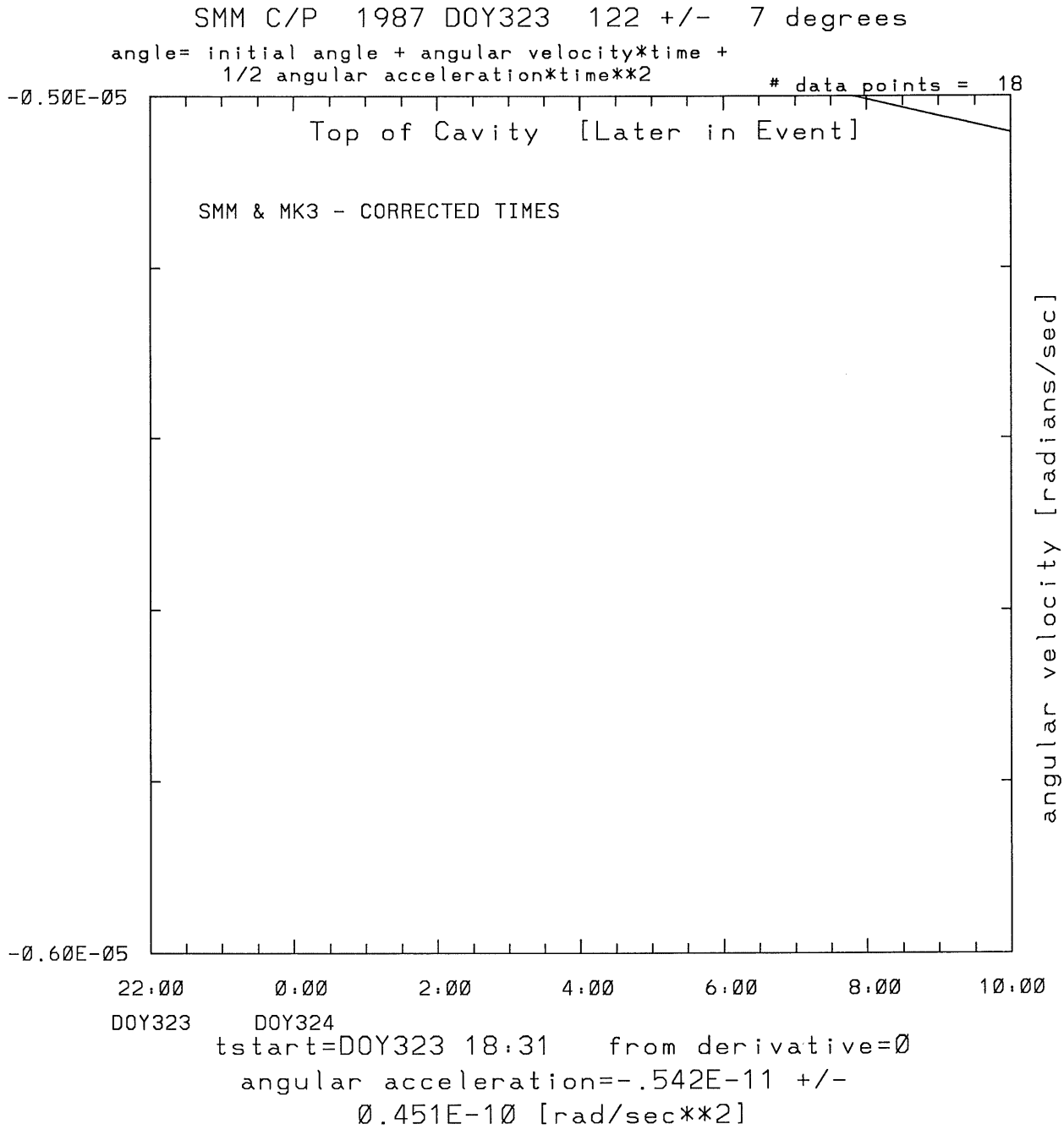

tstart=DOY323 18:31 from derivative=0

Event begins at 1.68 Solar Radii

radial acceleration= 0.0012 +/- 0.0001 [km/sec**2]


SMM C/P 1987 DOY323 122 +/- 7 degrees
angle= initial angle + angular velocity*time
+ 1/2 angular acceleration*time**2
# data points = 18
Top of Cavity [Later in Event]
radial acceleration=0.125E-02 km/sec**2
S=SMM M=MK3 P=PMON
SMM & MK3 - CORRECTED TIMES
position angle [degrees]
135
130
125
120
115
22:00
DOY323
0:00
DOY324
2:00
4:00
6:00
8:00
10:00
tstart=DOY323 18:31 from derivative=0
angular acceleration=-.542E-11 +/-0.451E-10 [rad/sec**2]


SMM C/P 1987 DOY323 122 +/- 7 degrees
height= h + vel*time + 1/2*accel*t
# data points = 18
Top of Cavity [Later in Event]
SMM & MK3 - CORRECTED TIMES
radial velocity (km/sec)
70.
65.
60.
55.
50.
45.
40.
35.
30.
25.
20.
15.
22:00
DOY323
0:00
DOY324
2:00
4:00
6:00
8:00
10:00
tstart=DOY323 18:31 from derivative=0
Event begins at 1.68 Solar Radii
radial acceleration=0.125E-02 km/sec**2


SMM C/P 1987 DOY323 122 +/- 7 degrees
angle= initial angle + angular velocity*time +
1/2 angular acceleration*time**2
# data points = 18
-0.50E-05
Top of Cavity [Later in Event]
SMM & MK3 - CORRECTED TIMES
angular velocity [radians/sec]
-0.60E-05
22:00
0:00
2:00
4:00
6:00
8:00
10:00
DOY323
DOY324
tstart=DOY323 18:31 from derivative=0
angular acceleration=-.542E-11 +/-
0.451E-10 [rad/sec**2]

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

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

| year | doy | time | radii | error in radius | angle | error in angle | datatype |
|---|---|---|---|---|---|---|---|
| 1987 | 323 | 22: 9:29 | 1.80 | +/- 0.15 | 129.0 | +/- 0.5 | SMM |
| 1987 | 323 | 22:25:59 | 1.90 | +/- 0.15 | 127.0 | +/- 0.5 | SMM |
| 1987 | 323 | 23:10: 4 | 2.00 | +/- 0.15 | 127.0 | +/- 0.5 | SMM |
| 1987 | 324 | 1:26: 5 | 2.23 | +/- 0.15 | 125.0 | +/- 0.5 | SMM |
| 1987 | 324 | 1:34:19 | 2.25 | +/- 0.15 | 126.0 | +/- 0.5 | SMM |
| 1987 | 324 | 2:26:42 | 2.34 | +/- 0.10 | 123.5 | +/- 0.5 | SMM |
| 1987 | 324 | 2:43:12 | 2.44 | +/- 0.10 | 124.5 | +/- 0.5 | SMM |
| 1987 | 324 | 2:59:42 | 2.50 | +/- 0.10 | 123.0 | +/- 0.5 | SMM |
| 1987 | 324 | 4: 0:51 | 2.75 | +/- 0.15 | 122.0 | +/- 0.5 | SMM |
| 1987 | 324 | 4:17:21 | 2.81 | +/- 0.15 | 122.0 | +/- 0.5 | SMM |
| 1987 | 324 | 4:33:51 | 2.93 | +/- 0.10 | 122.0 | +/- 0.5 | SMM |
| 1987 | 324 | 5:35: 2 | 3.14 | +/- 0.10 | 120.0 | +/- 1.0 | SMM |
| 1987 | 324 | 5:51:33 | 3.17 | +/- 0.10 | 120.0 | +/- 1.0 | SMM |
| 1987 | 324 | 6: 8: 3 | 3.25 | +/- 0.10 | 120.0 | +/- 1.0 | SMM |
| 1987 | 324 | 7: 9:13 | 3.57 | +/- 0.20 | 118.0 | +/- 1.0 | SMM |
| 1987 | 324 | 7:25:43 | 3.55 | +/- 0.15 | 119.0 | +/- 1.0 | SMM |
| 1987 | 324 | 7:42:13 | 3.72 | +/- 0.20 | 119.0 | +/- 1.0 | SMM |
| 1987 | 324 | 9:16:25 | 4.15 | +/- 0.25 | 118.0 | +/- 1.0 | SMM |

```
**************************************
 Structure being measured:
Top of Cavity [Later in Event]
**************************************

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

START TIME:

 Event began at t = 0 + -0.181E+03 +/-  0.194E+01 [minutes]
 In more convenient units:
 Event began at DOY 323 19: 1 +/-  0.194E+01 [minutes]

 Origin defined at DOY323 22: 0

RADIAL INFORMATION:

RADIAL VELOCITY =    39. +/-     2. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

 c(1) =    0.160E+01 +/-    0.618E-01 [solar radii]
 c(2) =    0.333E-02 +/-    0.163E-03 [radii/min]
 c(2) =    0.386E+02 +/-    0.190E+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)=  0.67755E-01 [radii] see Bevington pg. 114
                    error in c(2)=  0.17032E-03 [radii/min] see Bevington pg. 114
ANGULAR INFORMATION:

ANGULAR VELOCITY = -0.4899E-05 +/-   0.2678E-06[radians/sec]
```

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

 a(1) = 128. +/-   0. [degrees]
 a(2) =   -0.168E-01 +/-    0.921E-03 [degrees/min]
 a(2) =   -0.490E-05 +/-    0.268E-06 [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 RADIAL velocity at 22: 9 =   39. km/sec

The RADIAL velocity at 22:25 =   39. km/sec

The RADIAL velocity at 23:10 =   39. km/sec

The RADIAL velocity at  1:26 =   39. km/sec

The RADIAL velocity at  1:34 =   39. km/sec

The RADIAL velocity at  2:26 =   39. km/sec

The RADIAL velocity at  2:43 =   39. km/sec

The RADIAL velocity at  2:59 =   39. km/sec

The RADIAL velocity at  4: 0 =   39. km/sec

The RADIAL velocity at  4:17 =   39. km/sec

The RADIAL velocity at  4:33 =   39. km/sec

The RADIAL velocity at  5:35 =   39. km/sec

The RADIAL velocity at  5:51 =   39. km/sec

The RADIAL velocity at  6: 8 =   39. km/sec

The RADIAL velocity at  7: 9 =   39. km/sec

The RADIAL velocity at  7:25 =   39. km/sec

The RADIAL velocity at  7:42 =   39. km/sec

The RADIAL velocity at  9:16 =   39. km/sec


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

 Fit is ok [ier=1]

 Standard Deviation in the height =  0.68
 Standard Deviation in start time measurement =    0.190E+03
 Error in time =        0.16449E+03 using best fit method
 See Taylor Error Analysis [Univ of Colorado] pg.78

 Value of reduced Chi Squared returned from nllst2 = 0.117E-01
 Reduced Chi Squared = 0.191E+00
 Chi Squared = 0.306E+01
 The probability for exceeding chi square = 0.100E+01

 The correlation coefficient =    0.983E+00
 The probability that no LINEAR correlation exists between the variables =  -0.2883
 SEE BEVINGTON "Data Reduction and Error Analysis" [1969]
```

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

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

| year | doy | time | radii | error in radius | angle | error in angle | datatype |
|---|---|---|---|---|---|---|---|
| 1987 | 323 | 22: 9:29 | 1.80 | +/- 0.15 | 129.0 | +/- 0.5 | SMM |
| 1987 | 323 | 22:25:59 | 1.90 | +/- 0.15 | 127.0 | +/- 0.5 | SMM |
| 1987 | 323 | 23:10: 4 | 2.00 | +/- 0.15 | 127.0 | +/- 0.5 | SMM |
| 1987 | 324 | 1:26: 5 | 2.23 | +/- 0.15 | 125.0 | +/- 0.5 | SMM |
| 1987 | 324 | 1:34:19 | 2.25 | +/- 0.15 | 126.0 | +/- 0.5 | SMM |
| 1987 | 324 | 2:26:42 | 2.34 | +/- 0.10 | 123.5 | +/- 0.5 | SMM |
| 1987 | 324 | 2:43:12 | 2.44 | +/- 0.10 | 124.5 | +/- 0.5 | SMM |
| 1987 | 324 | 2:59:42 | 2.50 | +/- 0.10 | 123.0 | +/- 0.5 | SMM |
| 1987 | 324 | 4: 0:51 | 2.75 | +/- 0.15 | 122.0 | +/- 0.5 | SMM |
| 1987 | 324 | 4:17:21 | 2.81 | +/- 0.15 | 122.0 | +/- 0.5 | SMM |
| 1987 | 324 | 4:33:51 | 2.93 | +/- 0.10 | 122.0 | +/- 0.5 | SMM |
| 1987 | 324 | 5:35: 2 | 3.14 | +/- 0.10 | 120.0 | +/- 1.0 | SMM |
| 1987 | 324 | 5:51:33 | 3.17 | +/- 0.10 | 120.0 | +/- 1.0 | SMM |
| 1987 | 324 | 6: 8: 3 | 3.25 | +/- 0.10 | 120.0 | +/- 1.0 | SMM |
| 1987 | 324 | 7: 9:13 | 3.57 | +/- 0.20 | 118.0 | +/- 1.0 | SMM |
| 1987 | 324 | 7:25:43 | 3.55 | +/- 0.15 | 119.0 | +/- 1.0 | SMM |
| 1987 | 324 | 7:42:13 | 3.72 | +/- 0.20 | 119.0 | +/- 1.0 | SMM |
| 1987 | 324 | 9:16:25 | 4.15 | +/- 0.25 | 118.0 | +/- 1.0 | SMM |

```
****************************************
 Structure being measured:
Top of Cavity [Later in Event]
****************************************

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

START TIME:

 tstart=DOY323 18:31 from derivative = 0
Event begins at   1.68 Solar Radii
 Origin defined at DOY323 22: 0

RADIAL INFORMATION:

RADIAL ACCELERATION =  0.125E-02 +/-  0.136E-03 km/sec**2

The computed RADIAL coefficients and errors FROM NLLST2 are:

 c(1) =    0.182E+01 +/-    0.350E-01 [solar radii]
 c(2) =    0.135E-02 +/-    0.226E-03 [radii/min]
 c(2) =    0.157E+02 +/-    0.262E+01 [km/sec]
 c(3) =    0.323E-05 +/-    0.352E-06 [radii/min**2]
 c(3) =    0.125E-02 +/-    0.136E-03 [km/sec**2]

 The computed ERRORS in coefficients [BEVINGTON] are:

    Approximate error in c(1) =  0.30179E-01 [radii] Bevington pg 154 (8-30)
          Exact error in c(1) =  0.58828E-02 [radii] Bevington pg 154 (8-28)
    Approximate error in c(2) =  0.19518E-03 [radii/min] Bevington pg 154 (8-30)
          Exact error in c(2) =  0.37649E-04 [radii/min] Bevington pg 154 (8-28)
    Approximate error in c(3) =  0.28626E-06 [radii/min**2] Bevington pg 154 (8-30)
          Exact error in c(3) =  0.54030E-07 [radii/min**2] Bevington pg 154 (8-28)

ANGULAR INFORMATION:
```

ANGULAR ACCELERATION= -0.5419E-11 +/-  0.4507E-10[radians/sec**2]

The computed ANGULAR coefficients and errors FROM NLLST2 are:

 a(1) = 128. +/-  0. [degrees]
 a(2) =  -0.165E-01 +/-  0.275E-02 [degrees/min]
 a(2) =  -0.481E-05 +/-  0.800E-06 [rad/sec]
 a(3) =  -0.559E-06 +/-  0.465E-05 [degrees/min**2]
 a(3) =  -0.542E-11 +/-  0.451E-10 [rad/sec**2]

The RADIAL velocity at 22: 9 =  16. km/sec

The RADIAL velocity at 22:25 =  18. km/sec

The RADIAL velocity at 23:10 =  21. km/sec

The RADIAL velocity at  1:26 =  31. km/sec

The RADIAL velocity at  1:34 =  32. km/sec

The RADIAL velocity at  2:26 =  36. km/sec

The RADIAL velocity at  2:43 =  37. km/sec

The RADIAL velocity at  2:59 =  38. km/sec

The RADIAL velocity at  4: 0 =  43. km/sec

The RADIAL velocity at  4:17 =  44. km/sec

The RADIAL velocity at  4:33 =  45. km/sec

The RADIAL velocity at  5:35 =  50. km/sec

The RADIAL velocity at  5:51 =  51. km/sec

The RADIAL velocity at  6: 8 =  52. km/sec

The RADIAL velocity at  7: 9 =  57. km/sec

The RADIAL velocity at  7:25 =  58. km/sec

The RADIAL velocity at  7:42 =  59. km/sec

The RADIAL velocity at  9:16 =  66. km/sec

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

 Fit is ok [ier=1]

 Standard Deviation in the height =  0.68
 Standard Deviation in start time measurement =  0.190E+03
 Value of reduced Chi Squared returned from nllst2 = 0.198E-02
 Reduced Chi Squared = 0.206E-01
 Chi Squared = 0.308E+00
 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  =  0.8042E+00
 The correlation between the data and the time**2 term =  0.7754E+00
 The correlation between the data and the complete equation of motion=0.9938E+00

SEE BEVINGTON "Data Reduction and Error Analysis" [1969]