SMM C/P   1984 DOY322   75 +/-   5 degrees

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

6.00

Top of Cavity
angular velocity=0.794E-05 [radians/sec]

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

21:00   22:00   23:00   0:00   1:00   2:00   3:00
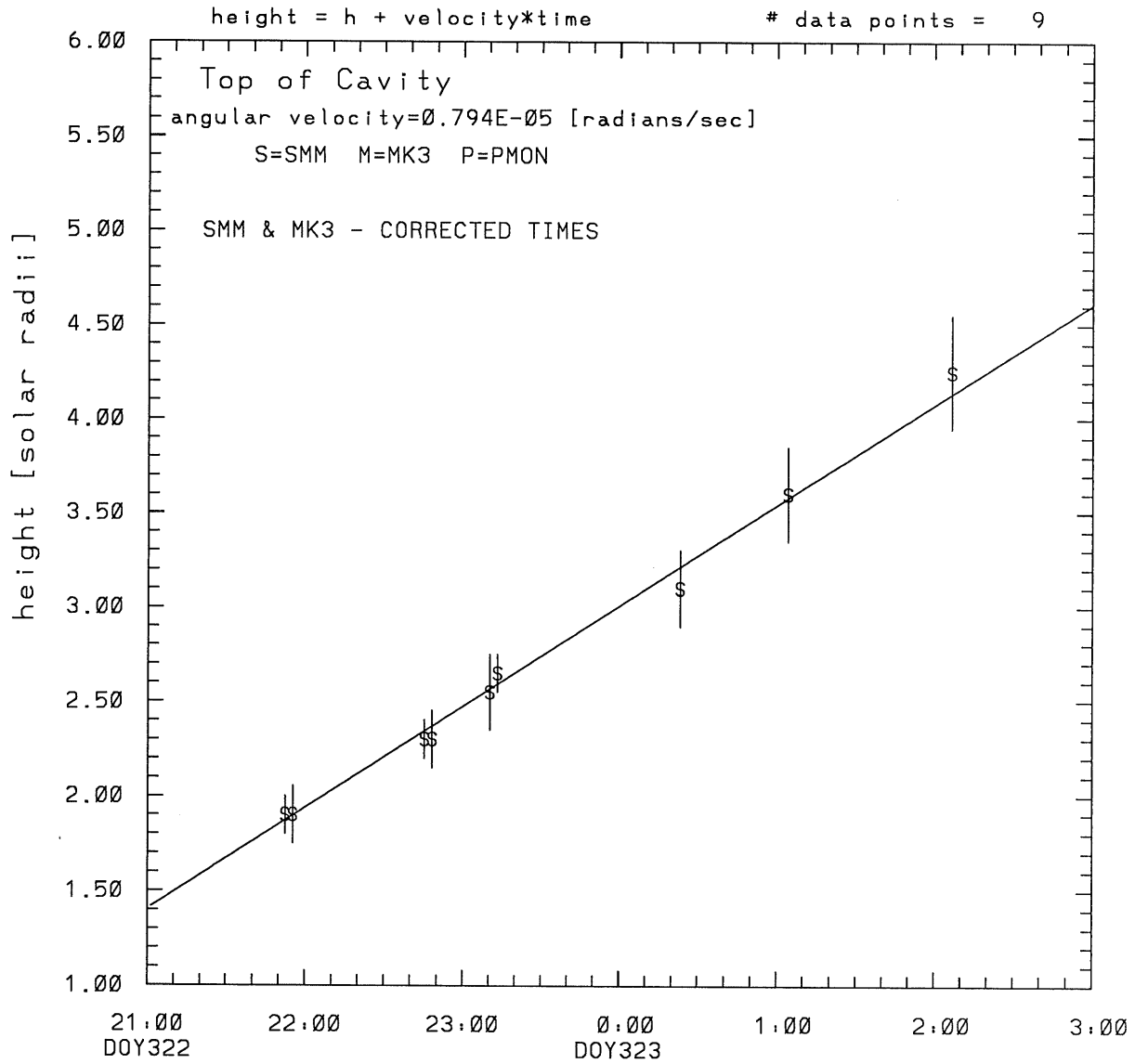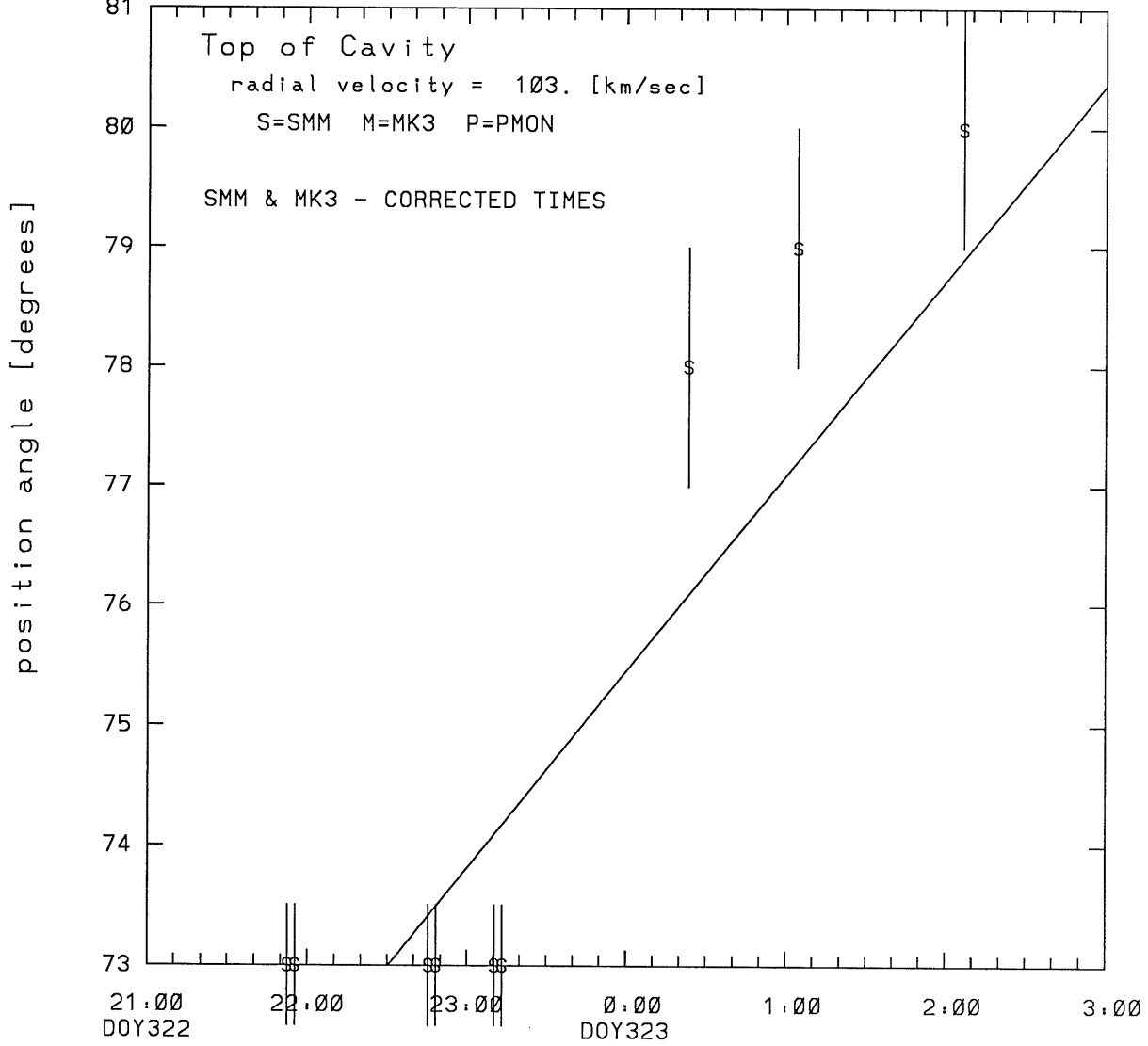DOY322   DOY323

        tstart=DOY322 20:15 +/-   0.2 [min.]
        radial velocity= 103. +/-   4. [km/sec]

SMM C/P 1984 DOY322   75 +/-   5 degrees

angle= initial angle + angular velocity*time   # data points =   9

Top of Cavity
    radial velocity = 103. [km/sec]
      S=SMM M=MK3 P=PMON

SMM & MK3 - CORRECTED TIMES

tstart=DOY322 20:15 +/-   0.2 [min.]
angular velocity=0.794E-05 +/- 0.177E-05 [rad/sec]

SMM C/P 1984 DOY322   75 +/- 5 degrees

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

Top of Cavity
ang. acceleration=0.141E-08 [rad/sec**2]
        S=SMM   M=MK3   P=PMON

    SMM & MK3 - CORRECTED TIMES

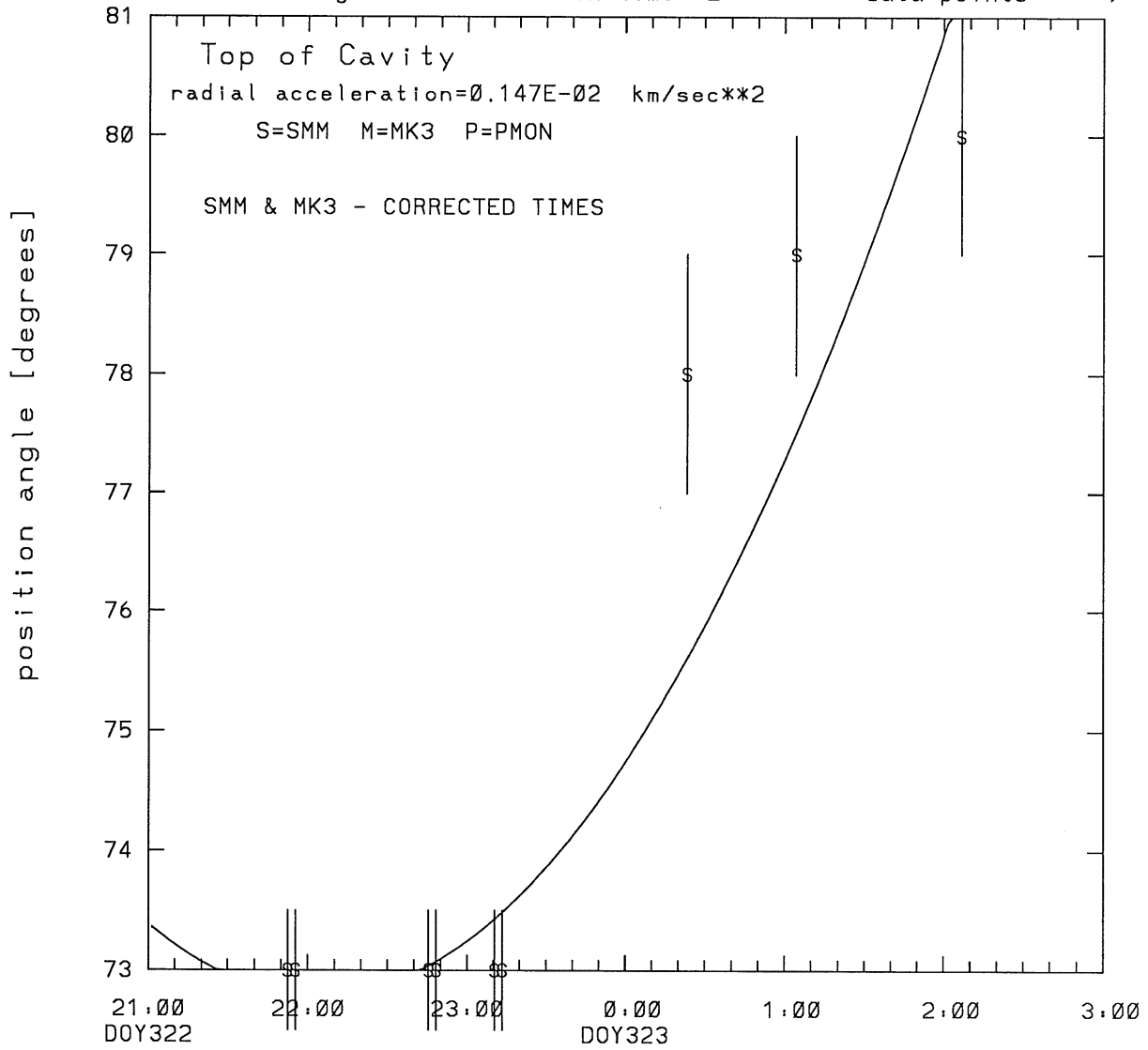tstart=DOY322 19:59 +/-   4.0 [min.]
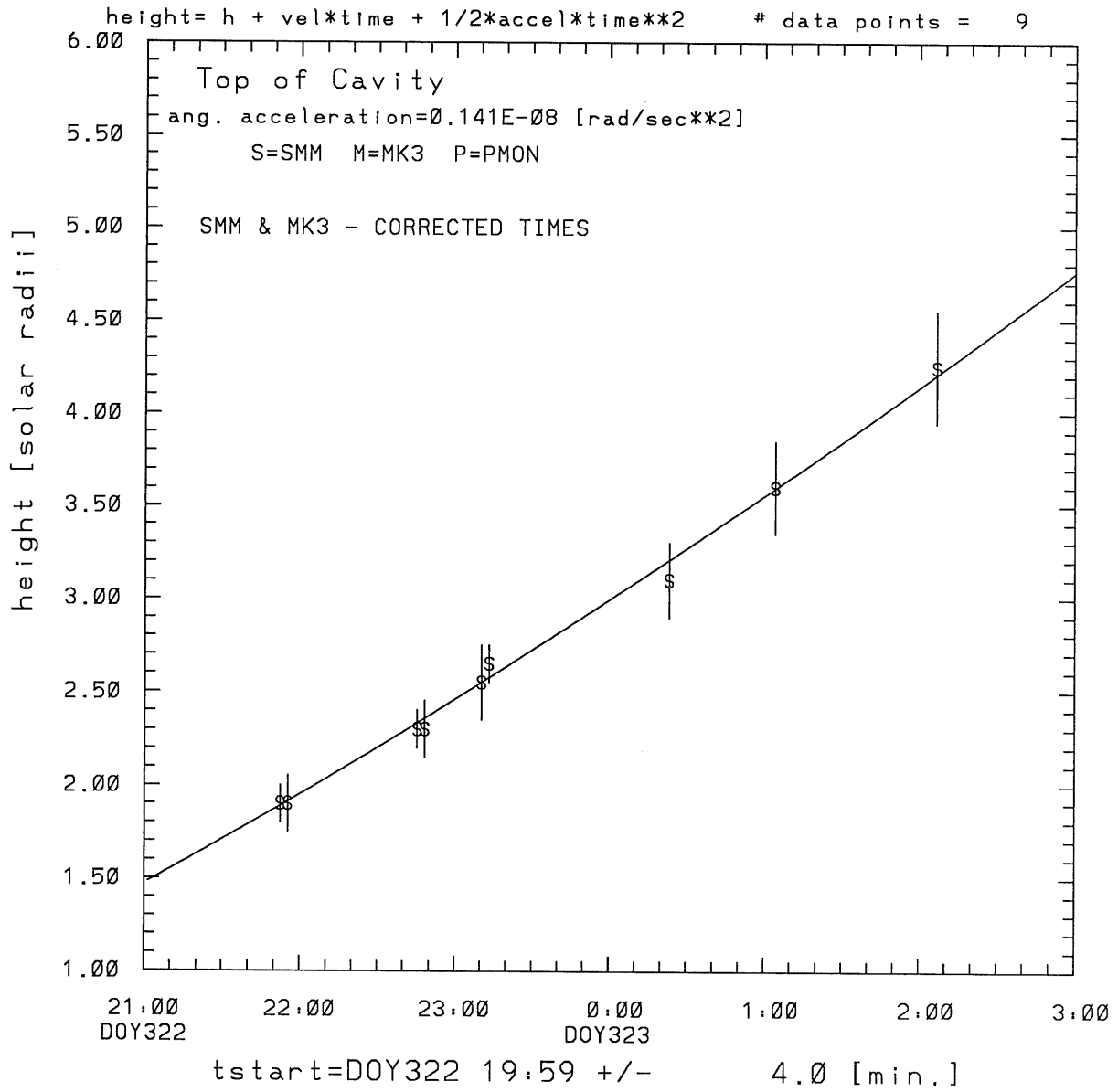
radial acceleration= 0.0015 +/- 0.0015 [km/sec**2]

SMM C/P 1984 DOY322   75 +/- 5 degrees

angle= initial angle + angular velocity*time
     + 1/2 angular acceleration*time**2   # data points =   9

Top of Cavity
radial acceleration=0.147E-02 km/sec**2

    S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

position angle [degrees]

81
80
79
78
77
76
75
74
73

21:00   22:00   23:00   0:00   1:00   2:00   3:00
DOY322   DOY323

tstart=DOY322 19:59 +/-   4.0 [min.]
angular acceleration=0.141E-08 +/-0.452E-09 [rad/sec**2]

SMM C/P   1984 DOY322   75 +/-   5 degrees

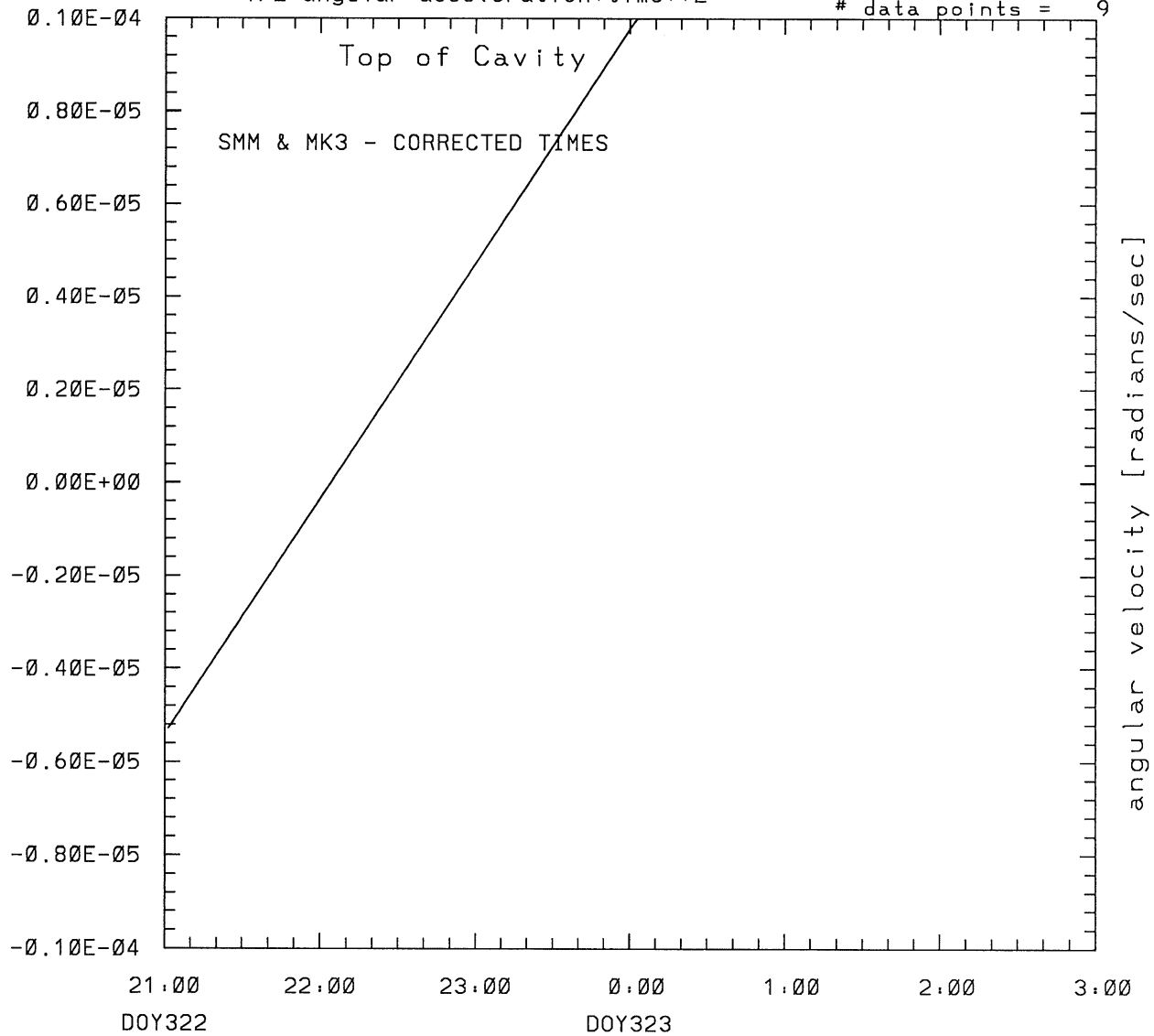height= h + vel*time + 1/2*accel*t   # data points =   9

Top of Cavity

SMM & MK3 - CORRECTED TIMES

radial velocity (km/sec)

122.
120.
118.
116.
114.
112.
110.
108.
106.
104.
102.
100.
98.
96.
94.
92.
90.

21:00   22:00   23:00   0:00   1:00   2:00   3:00
DOY322   DOY323

tstart=DOY322 19:59 +/-   4.0 [min.]

radial acceleration=0.147E-02 km/sec**2

SMM C/P 1984 DOY322   75 +/-   5 degrees

angle= initial angle + angular velocity*time +
1/2 angular acceleration*time**2

data points =   9

Top of Cavity

SMM & MK3 - CORRECTED TIMES

0.10E-04
0.80E-05
0.60E-05
0.40E-05
0.20E-05
0.00E+00
-0.20E-05
-0.40E-05
-0.60E-05
-0.80E-05
-0.10E-04

21:00   22:00   23:00   0:00   1:00   2:00   3:00
DOY322   DOY323

angular velocity [radians/sec]

tstart=DOY322 19:59 +/-   4.0 [min.]
angular acceleration=0.141E-08 +/-
0.452E-09 [rad/sec**2]

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

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

                                  error in       error in
year doy     time     radii   radius     angle    angle    datatype
1984 322  21:52:23   1.90 +/- 0.10      73.0 +/-  0.5        SMM
1984 322  21:55:19   1.90 +/- 0.15      73.0 +/-  0.5        SMM
1984 322  22:45:25   2.30 +/- 0.10      73.0 +/-  0.5        SMM
1984 322  22:48:21   2.30 +/- 0.15      73.0 +/-  0.5        SMM
1984 322  23:10:23   2.55 +/- 0.20      73.0 +/-  0.5        SMM
1984 322  23:13:19   2.65 +/- 0.10      73.0 +/-  0.5        SMM
1984 323   0:23:19   3.10 +/- 0.20      78.0 +/-  1.0        SMM
1984 323   1: 4:19   3.60 +/- 0.25      79.0 +/-  1.0        SMM
1984 323   2: 6:39   4.25 +/- 0.30      80.0 +/-  1.0        SMM


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

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

START TIME:

 Event began at t = 0 + -0.453E+02 +/-  0.198E+00 [minutes]
 In more convenient units:
 Event began at DOY 322 20:15 +/-  0.198E+00 [minutes]

 Origin defined at DOY322 21: 0

RADIAL INFORMATION:

RADIAL VELOCITY =   103. +/-      4. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

 c(1) =     0.140E+01 +/-    0.418E-01 [solar radii]
 c(2) =     0.891E-02 +/-    0.335E-03 [radii/min]
 c(2) =     0.103E+03 +/-    0.388E+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)=  0.51264E-01 [radii] see Bevington pg. 114
            error in c(2)=  0.30249E-03 [radii/min] see Bevington pg. 114
ANGULAR INFORMATION:

ANGULAR VELOCITY =  0.7939E-05 +/-    0.1774E-05[radians/sec]

The computed ANGULAR coefficients and errors FROM NLLST2 are:

 a(1) =   71. +/-    1. [degrees]
 a(2) =     0.273E-01 +/-    0.610E-02 [degrees/min]
 a(2) =     0.794E-05 +/-    0.177E-05 [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 21:52 =   103. km/sec
```

The RADIAL velocity at 21:55 =   103. km/sec

The RADIAL velocity at 22:45 =   103. km/sec

The RADIAL velocity at 22:48 =   103. km/sec

The RADIAL velocity at 23:10 =   103. km/sec

The RADIAL velocity at 23:13 =   103. km/sec

The RADIAL velocity at 0:23 =   103. km/sec

The RADIAL velocity at 1: 4 =   103. km/sec

The RADIAL velocity at 2: 6 =   103. km/sec

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

 Fit is ok [ier=1]

 Standard Deviation in the height = 0.79
 Standard Deviation in start time measurement =   0.811E+02
 Error in time =   0.21850E+02 using best fit method
 See Taylor Error Analysis [Univ of Colorado] pg.78

 Value of reduced Chi Squared returned from nllst2 = 0.317E-02
 Reduced Chi Squared = 0.373E-01
 Chi Squared = 0.261E+00
 The probability for exceeding chi square = 0.100E+01

 The correlation coefficient =   0.997E+00
 The probability that no LINEAR correlation exists between the variables =   0.7769]
 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
 1984 322  21:52:23   1.90 +/- 0.10    73.0 +/-  0.5      SMM
 1984 322  21:55:19   1.90 +/- 0.15    73.0 +/-  0.5      SMM
 1984 322  22:45:25   2.30 +/- 0.10    73.0 +/-  0.5      SMM
 1984 322  22:48:21   2.30 +/- 0.15    73.0 +/-  0.5      SMM
 1984 322  23:10:23   2.55 +/- 0.20    73.0 +/-  0.5      SMM
 1984 322  23:13:19   2.65 +/- 0.10    73.0 +/-  0.5      SMM
 1984 323   0:23:19   3.10 +/- 0.20    78.0 +/-  1.0      SMM
 1984 323   1: 4:19   3.60 +/- 0.25    79.0 +/-  1.0      SMM
 1984 323   2: 6:39   4.25 +/- 0.30    80.0 +/-  1.0      SMM

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

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

START TIME:

 Event began at t = 0 + -0.625E+02 +/-  0.405E+01 [minutes]
 In more convenient units:
 Event began at DOY 322 19:59 +/-  0.405E+01 [minutes]

 Origin defined at DOY322 21: 0

RADIAL INFORMATION:

RADIAL ACCELERATION =  0.147E-02 +/-  0.147E-02 km/sec**2

The computed RADIAL coefficients and errors FROM NLLST2 are:

 c(1) =     0.147E+01 +/-    0.794E-01 [solar radii]
 c(2) =     0.777E-02 +/-    0.118E-02 [radii/min]
 c(2) =     0.902E+02 +/-    0.137E+02 [km/sec]
 c(3) =     0.379E-05 +/-    0.379E-05 [radii/min**2]
 c(3) =     0.147E-02 +/-    0.147E-02 [km/sec**2]

 The computed ERRORS in coefficients [BEVINGTON] are:

    Approximate error in c(1) =  0.91569E-01 [radii] Bevington pg 154 (8-30)
          Exact error in c(1) =  0.73934E-02 [radii] Bevington pg 154 (8-28)
    Approximate error in c(2) =  0.12328E-02 [radii/min] Bevington pg 154 (8-30)
          Exact error in c(2) =  0.87898E-04 [radii/min] Bevington pg 154 (8-28)
    Approximate error in c(3) =  0.34451E-05 [radii/min**2] Bevington pg 154 (8-30)
          Exact error in c(3) =  0.24089E-06 [radii/min**2] Bevington pg 154 (8-28)

ANGULAR INFORMATION:

ANGULAR ACCELERATION=  0.1405E-08 +/-   0.4521E-09[radians/sec**2]

The computed ANGULAR coefficients and errors FROM NLLST2 are:

 a(1) =  73. +/-   1. [degrees]
 a(2) =    -0.186E-01 +/-     0.153E-01 [degrees/min]
```

```
a(2) =    -0.540E-05 +/-     0.446E-05 [rad/sec]
a(3) =     0.145E-03 +/-     0.466E-04 [degrees/min**2]
a(3) =     0.141E-08 +/-     0.452E-09 [rad/sec**2]
```

The RADIAL velocity at 21:52 =   95. km/sec

The RADIAL velocity at 21:55 =   95. km/sec

The RADIAL velocity at 22:45 =   99. km/sec

The RADIAL velocity at 22:48 = 100. km/sec

The RADIAL velocity at 23:10 = 102. km/sec

The RADIAL velocity at 23:13 = 102. km/sec

The RADIAL velocity at 0:23 = 108. km/sec

The RADIAL velocity at 1: 4 = 112. km/sec

The RADIAL velocity at 2: 6 = 117. km/sec


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

Fit is ok [ier=1]

Standard Deviation in the height = 0.79
Standard Deviation in start time measurement =   0.811E+02
Value of reduced Chi Squared returned from nllst2 = 0.318E-02
Reduced Chi Squared = 0.244E-01
Chi Squared = 0.147E+00
The probability for exceeding chi square = 0.100E+01

For a second order fit 3 correlation coefficients are given:
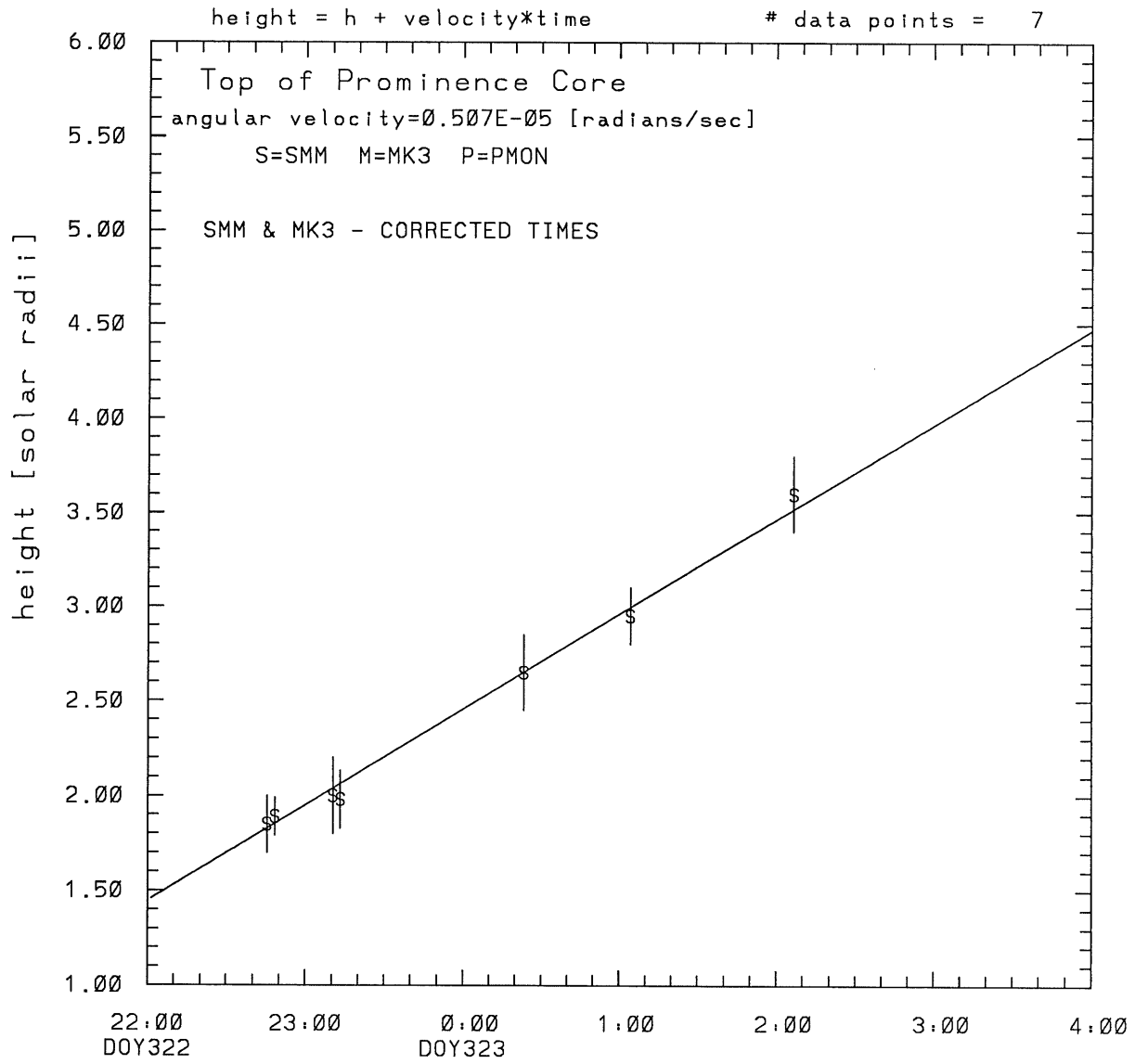 (Using equation of motion: r = a + bt + at**2)
The correlation between the data and the term linear in time =   0.8267E+00
The correlation between the data and the time**2 term =   0.7342E+00
The correlation between the data and the complete equation of motion=0.1002E+01
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]

SMM C/P 1984 DOY322   71 +/- 2 degrees

height = h + velocity*time   # data points =   7

Top of Prominence Core
angular velocity=0.507E-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   23:00   0:00   1:00   2:00   3:00   4:00
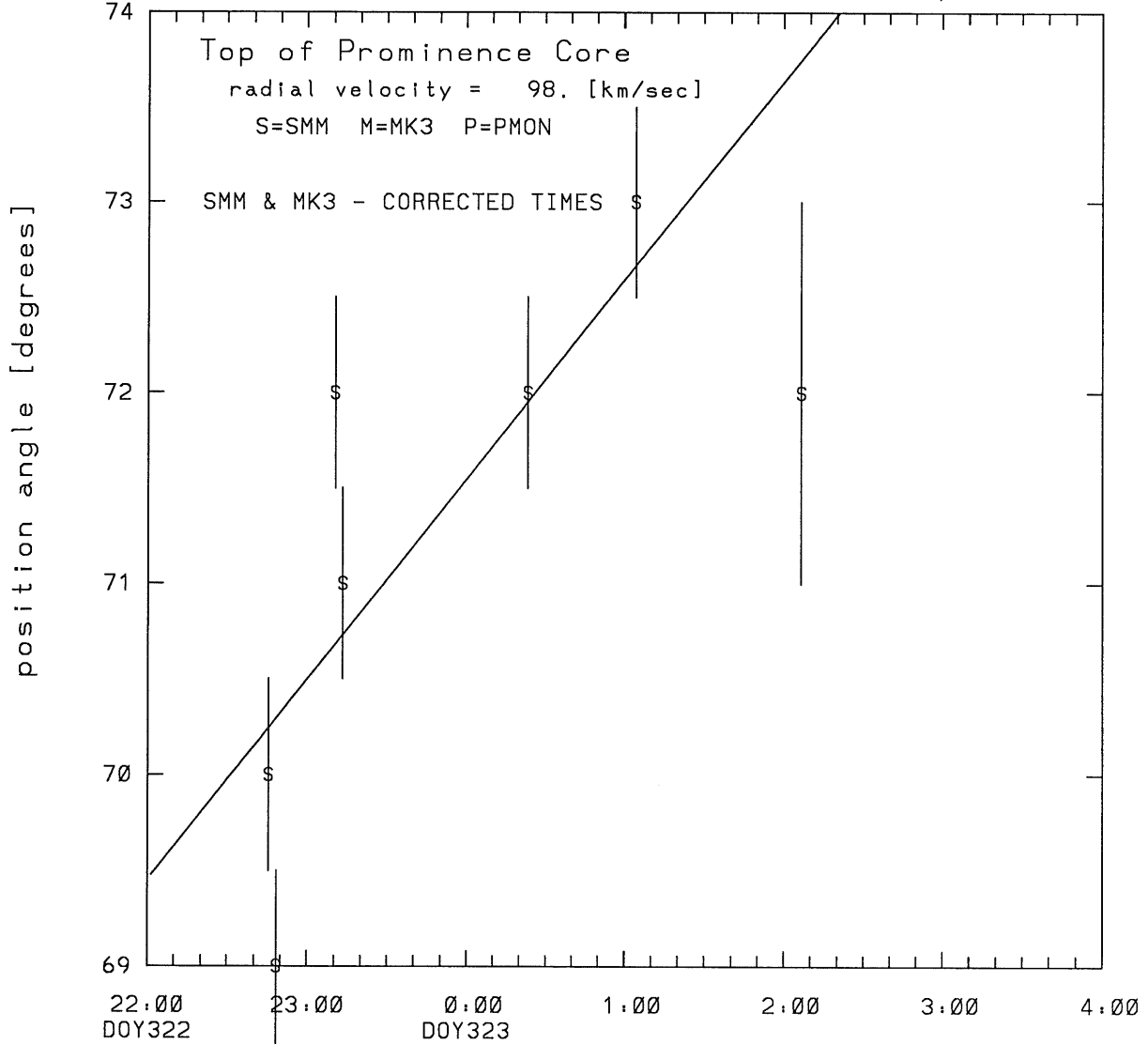DOY322   DOY323

tstart=DOY322 21: 7 +/-   0.6 [min.]
radial velocity=   98. +/-   4. [km/sec]

SMM C/P 1984 DOY322   71 +/- 2 degrees

angle= initial angle + angular velocity*time   # data points =   7

Top of Prominence Core
   radial velocity =   98. [km/sec]
      S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

position angle [degrees]

74
73
72
71
70
69

22:00   23:00   0:00   1:00   2:00   3:00   4:00
DOY322   DOY323

tstart=DOY322 21: 7 +/-   0.6 [min.]
angular velocity=0.507E-05 +/- 0.170E-05 [rad/sec]

SMM C/P 1984 DOY322   71 +/- 2 degrees
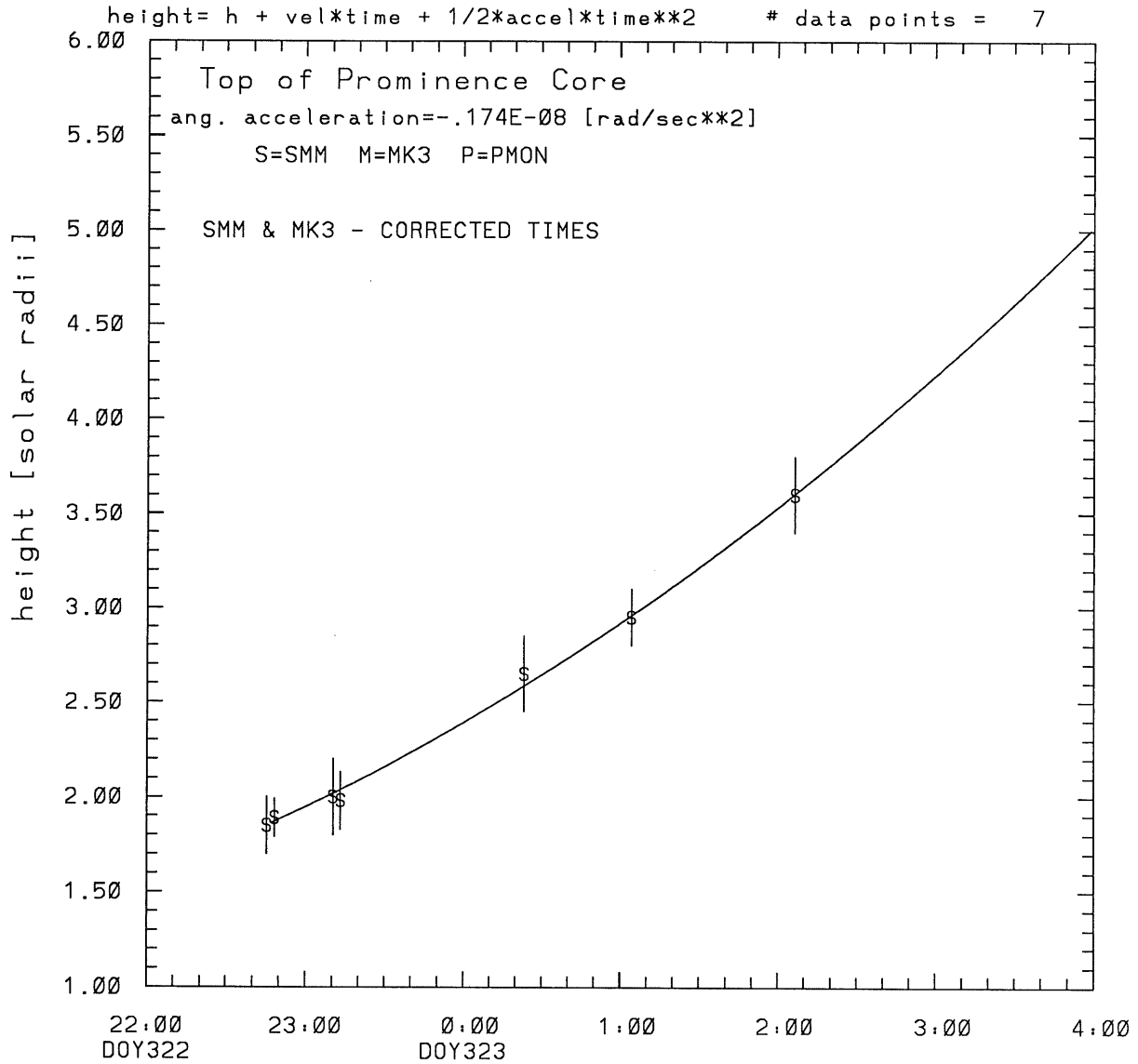
height= h + vel*time + 1/2*accel*time**2   # data points =   7

Top of Prominence Core
ang. acceleration=-.174E-08 [rad/sec**2]
      S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

height [solar radii]

22:00   23:00   0:00   1:00   2:00   3:00   4:00
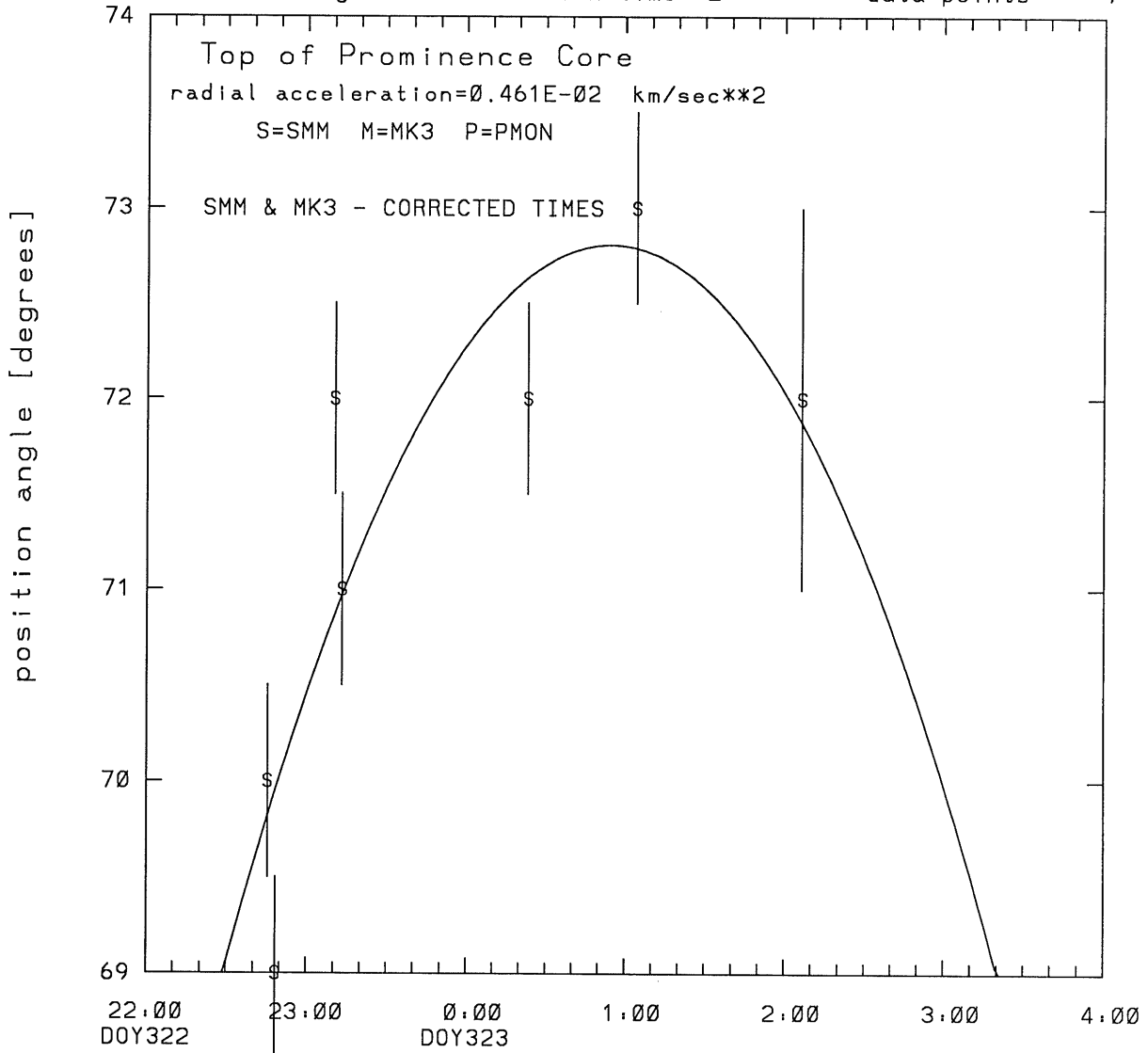DOY322   DOY323

tstart=DOY322 18:21   from derivative=0
Event begins at   1.01 Solar Radii
radial acceleration= 0.0046 +/- 0.0017 [km/sec**2]

SMM C/P 1984 DOY322   71 +/- 2 degrees

angle= initial angle + angular velocity*time
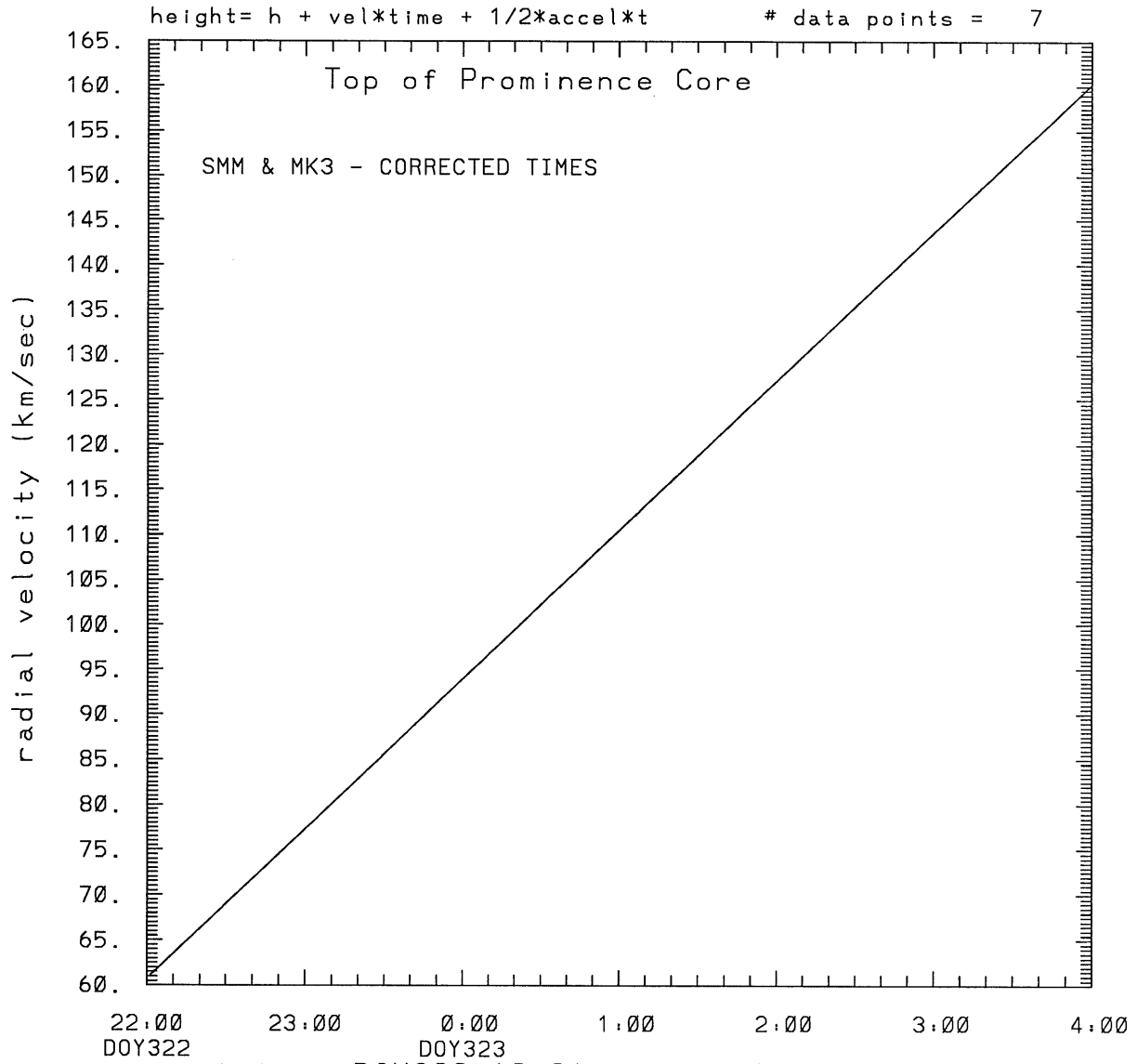   + 1/2 angular acceleration*time**2   # data points =   7

74

Top of Prominence Core
radial acceleration=0.461E-02 km/sec**2
        S=SMM   M=MK3   P=PMON

73   SMM & MK3 - CORRECTED TIMES $

position angle [degrees]

72                $ $ $

71            $

70      $

69 $

22:00   23:00   0:00   1:00   2:00   3:00   4:00
DOY322   DOY323

tstart=DOY322 18:21   from derivative=0
angular acceleration=-.174E-08 +/-0.962E-09 [rad/sec**2]

SMM C/P 1984 DOY322 71 +/- 2 degrees

height= h + vel*time + 1/2*accel*t   # data points =   7

Top of Prominence Core

SMM & MK3 - CORRECTED TIMES

radial velocity (km/sec)

165.
160.
155.
150.
145.
140.
135.
130.
125.
120.
115.
110.
105.
100.
95.
90.
85.
80.
75.
70.
65.
60.

22:00   23:00   0:00   1:00   2:00   3:00   4:00
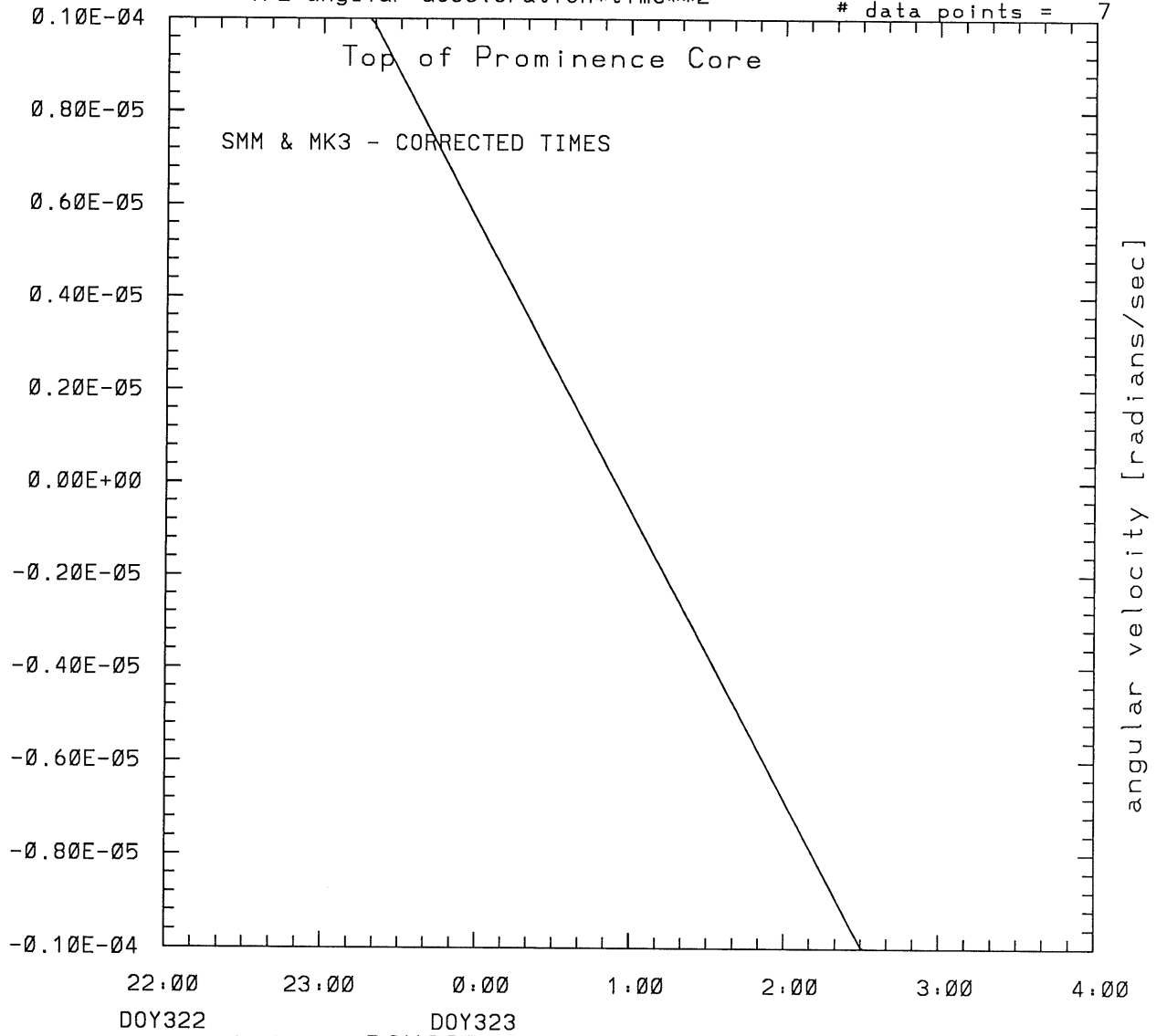DOY322   DOY323

tstart=DOY322 18:21   from derivative=0
Event begins at   1.01 Solar Radii
radial acceleration=0.461E-02 km/sec**2

SMM C/P 1984 DOY322   71 +/- 2 degrees

angle= initial angle + angular velocity*time +
       1/2 angular acceleration*time**2

data points =   7

```
0.10E-04 ┬────────────────────────────────────────────────
         │          Top\ of Prominence Core
0.80E-05 ┤
         │      SMM & MK3 - CORRECTED TIMES
0.60E-05 ┤
         │
0.40E-05 ┤
         │
0.20E-05 ┤
         │
0.00E+00 ┤
         │
-0.20E-05┤
         │
-0.40E-05┤
         │
-0.60E-05┤
         │
-0.80E-05┤
         │
-0.10E-04 ┴────────────────────────────────────────────────
       22:00   23:00   0:00    1:00    2:00    3:00   4:00
```

angular velocity [radians/sec]

DOY322   DOY323

tstart=DOY322 18:21   from derivative=0
angular acceleration=-.174E-08 +/-
        0.962E-09 [rad/sec**2]

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

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

                                  error in        error in
    year doy    time    radii    radius     angle    angle    datatype
    1984 322  22:45:25  1.85 +/- 0.15      70.0 +/-  0.5        SMM
    1984 322  22:48:21  1.89 +/- 0.10      69.0 +/-  0.5        SMM
    1984 322  23:10:23  2.00 +/- 0.20      72.0 +/-  0.5        SMM
    1984 322  23:13:19  1.98 +/- 0.15      71.0 +/-  0.5        SMM
    1984 323   0:23:19  2.65 +/- 0.20      72.0 +/-  0.5        SMM
    1984 323   1: 4:19  2.95 +/- 0.15      73.0 +/-  0.5        SMM
    1984 323   2: 6:39  3.60 +/- 0.20      72.0 +/-  1.0        SMM

*****************************************
 Structure being measured:
Top of Prominence Core
*****************************************

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

START TIME:

  Event began at t = 0 + -0.531E+02 +/-  0.637E+00 [minutes]
  In more convenient units:
  Event began at DOY 322 21: 7 +/-  0.637E+00 [minutes]

  Origin defined at DOY322 22: 0

RADIAL INFORMATION:

RADIAL VELOCITY =     98. +/-      4. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

  c(1) =     0.145E+01 +/-    0.357E-01 [solar radii]
  c(2) =     0.841E-02 +/-    0.305E-03 [radii/min]
  c(2) =     0.975E+02 +/-    0.354E+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)=  0.43912E-01 [radii] see Bevington pg. 114
              error in c(2)=  0.32213E-03 [radii/min] see Bevington pg. 114
ANGULAR INFORMATION:

ANGULAR VELOCITY =  0.5071E-05 +/-    0.1702E-05[radians/sec]

The computed ANGULAR coefficients and errors FROM NLLST2 are:

  a(1) =  69. +/-    1. [degrees]
  a(2) =     0.174E-01 +/-    0.585E-02 [degrees/min]
  a(2) =     0.507E-05 +/-    0.170E-05 [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 22:45 =   98. km/sec

The RADIAL velocity at 22:48 =   98. km/sec
```

The RADIAL velocity at 23:10 =   98. km/sec

The RADIAL velocity at 23:13 =   98. km/sec

The RADIAL velocity at 0:23 =   98. km/sec

The RADIAL velocity at 1: 4 =   98. km/sec

The RADIAL velocity at 2: 6 =   98. km/sec

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

 Fit is ok [ier=1]

 Standard Deviation in the height = 0.67
 Standard Deviation in start time measurement =   0.717E+02
 Error in time =   0.16242E+02 using best fit method
 See Taylor Error Analysis [Univ of Colorado] pg.78

 Value of reduced Chi Squared returned from nllst2 = 0.285E-02
 Reduced Chi Squared = 0.185E-01
 Chi Squared = 0.923E-01
 The probability for exceeding chi square = 0.100E+01

 The correlation coefficient =   0.997E+00
 The probability that no LINEAR correlation exists between the variables =   0.99761
 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
1984 322  22:45:25   1.85 +/- 0.15     70.0 +/-  0.5      SMM
1984 322  22:48:21   1.89 +/- 0.10     69.0 +/-  0.5      SMM
1984 322  23:10:23   2.00 +/- 0.20     72.0 +/-  0.5      SMM
1984 322  23:13:19   1.98 +/- 0.15     71.0 +/-  0.5      SMM
1984 323   0:23:19   2.65 +/- 0.20     72.0 +/-  0.5      SMM
1984 323   1: 4:19   2.95 +/- 0.15     73.0 +/-  0.5      SMM
1984 323   2: 6:39   3.60 +/- 0.20     72.0 +/-  1.0      SMM


******************************************
 Structure being measured:
Top of Prominence Core
******************************************


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


START TIME:

 tstart=DOY322 18:21 from derivative = 0
Event begins at   1.01 Solar Radii
 Origin defined at DOY322 22: 0

RADIAL INFORMATION:

RADIAL ACCELERATION =  0.461E-02 +/-  0.169E-02 km/sec**2

The computed RADIAL coefficients and errors FROM NLLST2 are:

 c(1) =      0.159E+01 +/-     0.582E-01 [solar radii]
 c(2) =      0.524E-02 +/-     0.118E-02 [radii/min]
 c(2) =      0.607E+02 +/-     0.137E+02 [km/sec]
 c(3) =      0.119E-04 +/-     0.438E-05 [radii/min**2]
 c(3) =      0.461E-02 +/-     0.169E-02 [km/sec**2]

 The computed ERRORS in coefficients [BEVINGTON] are:

     Approximate error in c(1) =  0.72066E-01 [radii] Bevington pg 154 (8-30)
           Exact error in c(1) =  0.60859E-02 [radii] Bevington pg 154 (8-28)
     Approximate error in c(2) =  0.13133E-02 [radii/min] Bevington pg 154 (8-30)
           Exact error in c(2) =  0.15492E-03 [radii/min] Bevington pg 154 (8-28)
     Approximate error in c(3) =  0.46053E-05 [radii/min**2] Bevington pg 154 (8-30)
           Exact error in c(3) =  0.54504E-06 [radii/min**2] Bevington pg 154 (8-28)

ANGULAR INFORMATION:

ANGULAR ACCELERATION= -0.1739E-08 +/-   0.9624E-09[radians/sec**2]

The computed ANGULAR coefficients and errors FROM NLLST2 are:

 a(1) =  67. +/-   1. [degrees]
 a(2) =     0.626E-01 +/-    0.255E-01 [degrees/min]
 a(2) =     0.182E-04 +/-    0.741E-05 [rad/sec]
 a(3) =    -0.179E-03 +/-    0.992E-04 [degrees/min**2]
 a(3) =    -0.174E-08 +/-    0.962E-09 [rad/sec**2]
```

The RADIAL velocity at 22:45 =   73. km/sec

The RADIAL velocity at 22:48 =   74. km/sec

The RADIAL velocity at 23:10 =   80. km/sec

The RADIAL velocity at 23:13 =   81. km/sec

The RADIAL velocity at 0:23 =   100. km/sec

The RADIAL velocity at 1: 4 =   112. km/sec

The RADIAL velocity at 2: 6 =   129. km/sec

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

 Fit is ok [ier=1]

 Standard Deviation in the height = 0.67
 Standard Deviation in start time measurement =   0.717E+02
 Value of reduced Chi Squared returned from nllst2 = 0.138E-02
 Reduced Chi Squared = 0.924E-02
 Chi Squared = 0.370E-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 =   0.9582E+00
 The correlation between the data and the time**2 term =   0.9015E+00
 The correlation between the data and the complete equation of motion=0.9975E+00
 SEE BEVINGTON "Data Reduction and Error Analysis" [1969]