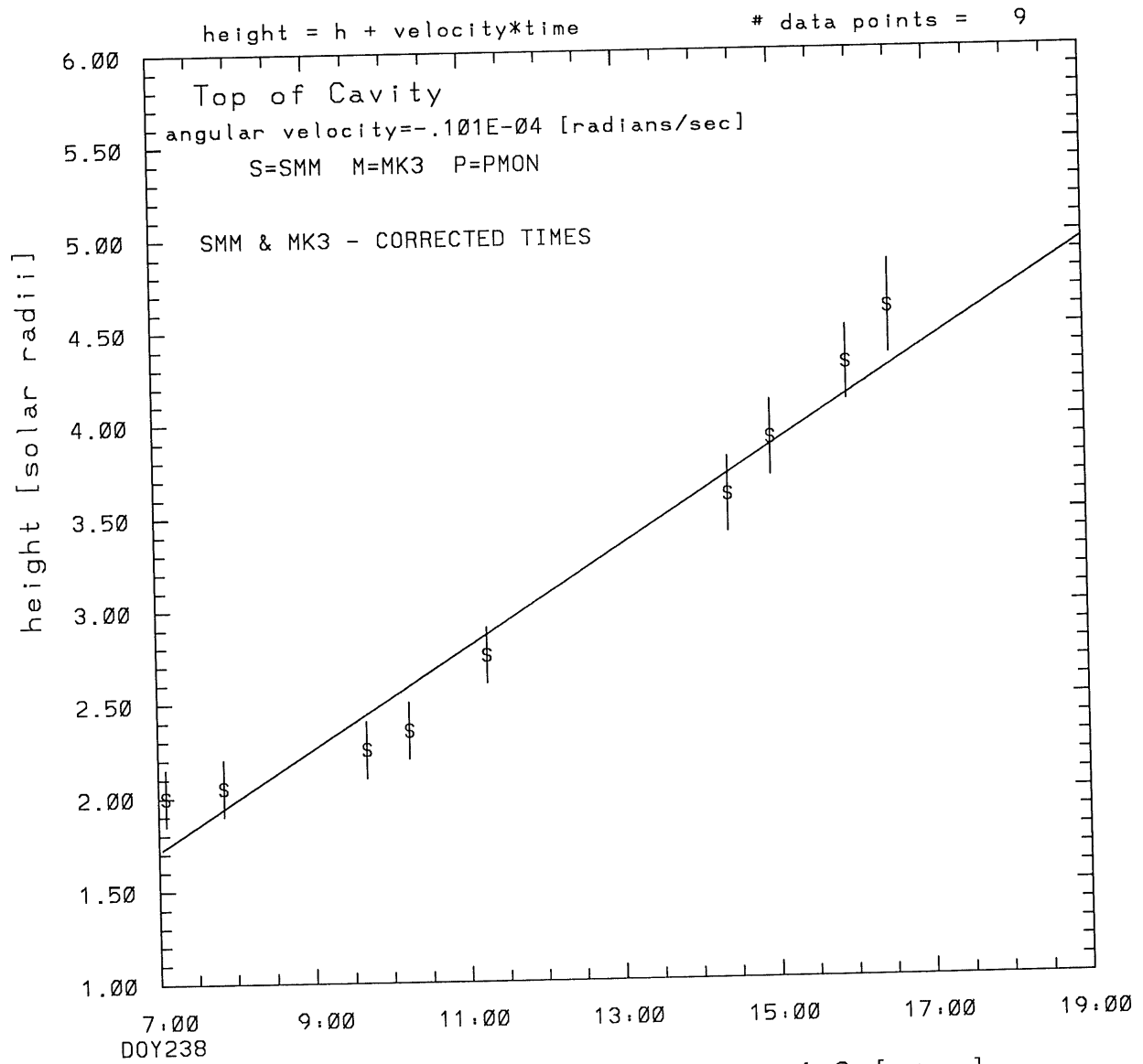
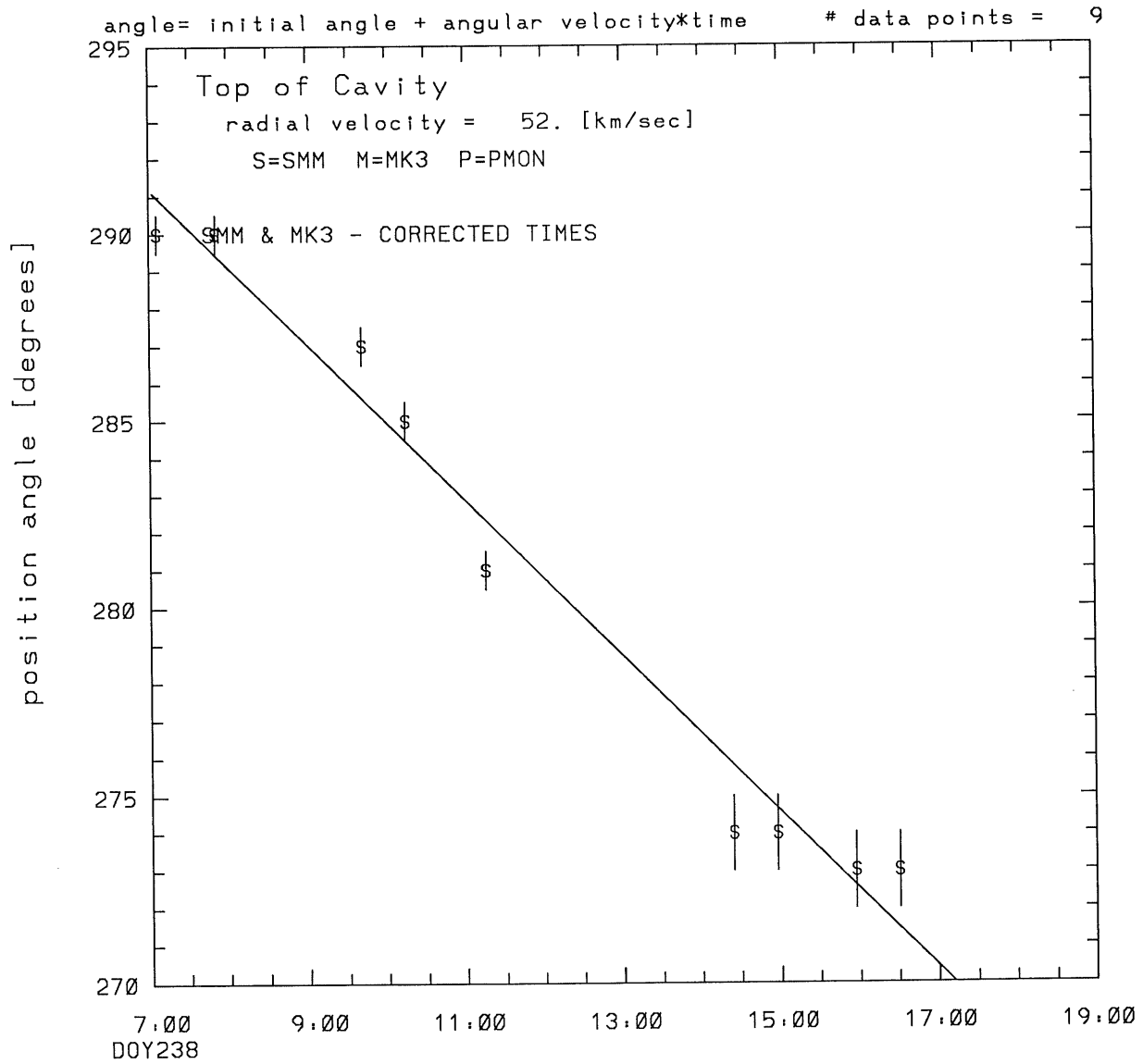


SMM C/P 1987 DOY238 280 +/- 10 degrees



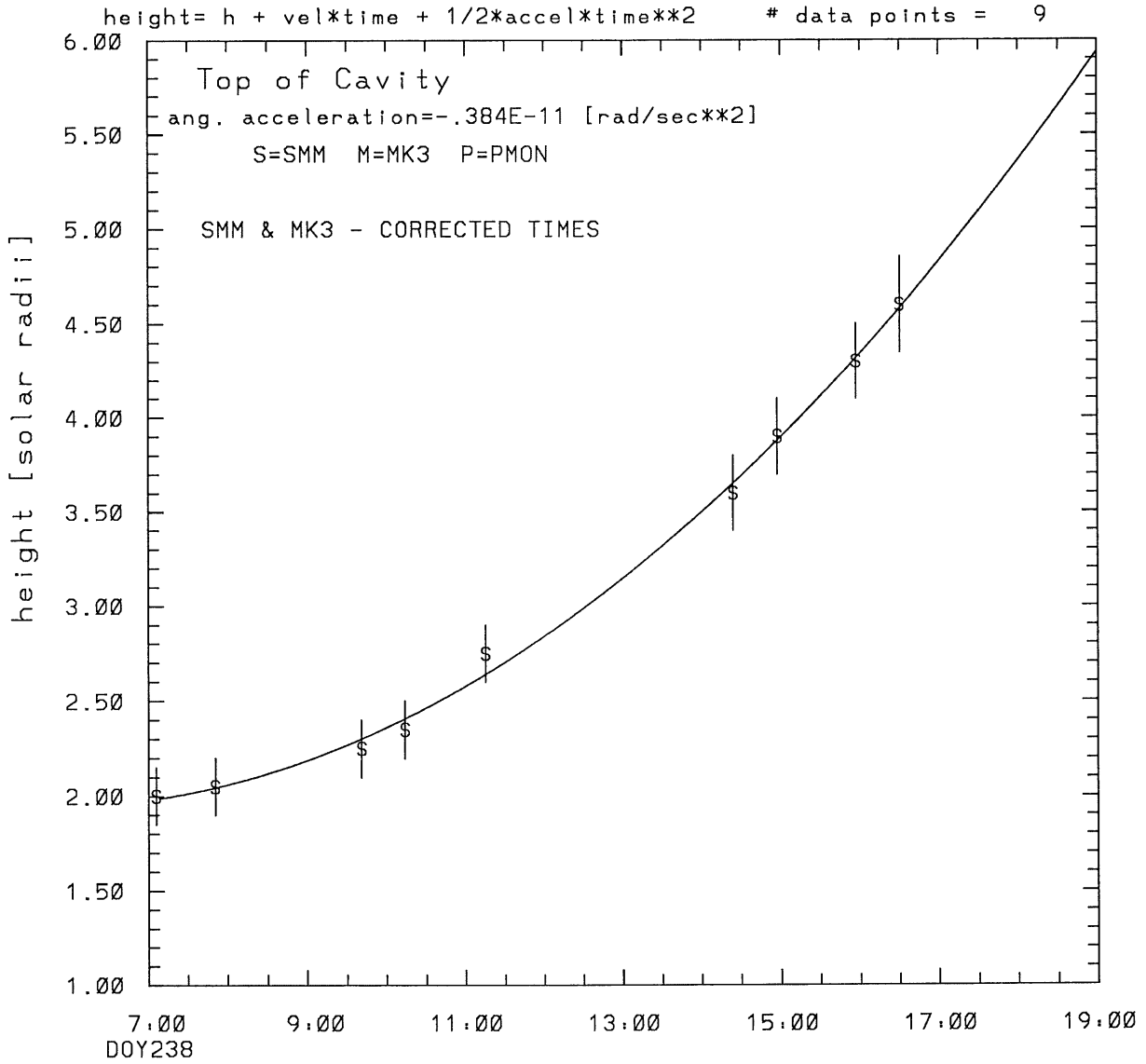
tstart=DOY238 4:22 +/- 4.3 [min.]  
radial velocity= 52. +/- 4. [km/sec]

SMM C/P 1987 DOY238 280 +/- 10 degrees



tstart=DOY238 4.22 +/- 4.3 [min.]  
angular velocity=-.101E-04 +/- 0.672E-06 [rad/sec]

SMM C/P 1987 DOY238 280 +/- 10 degrees

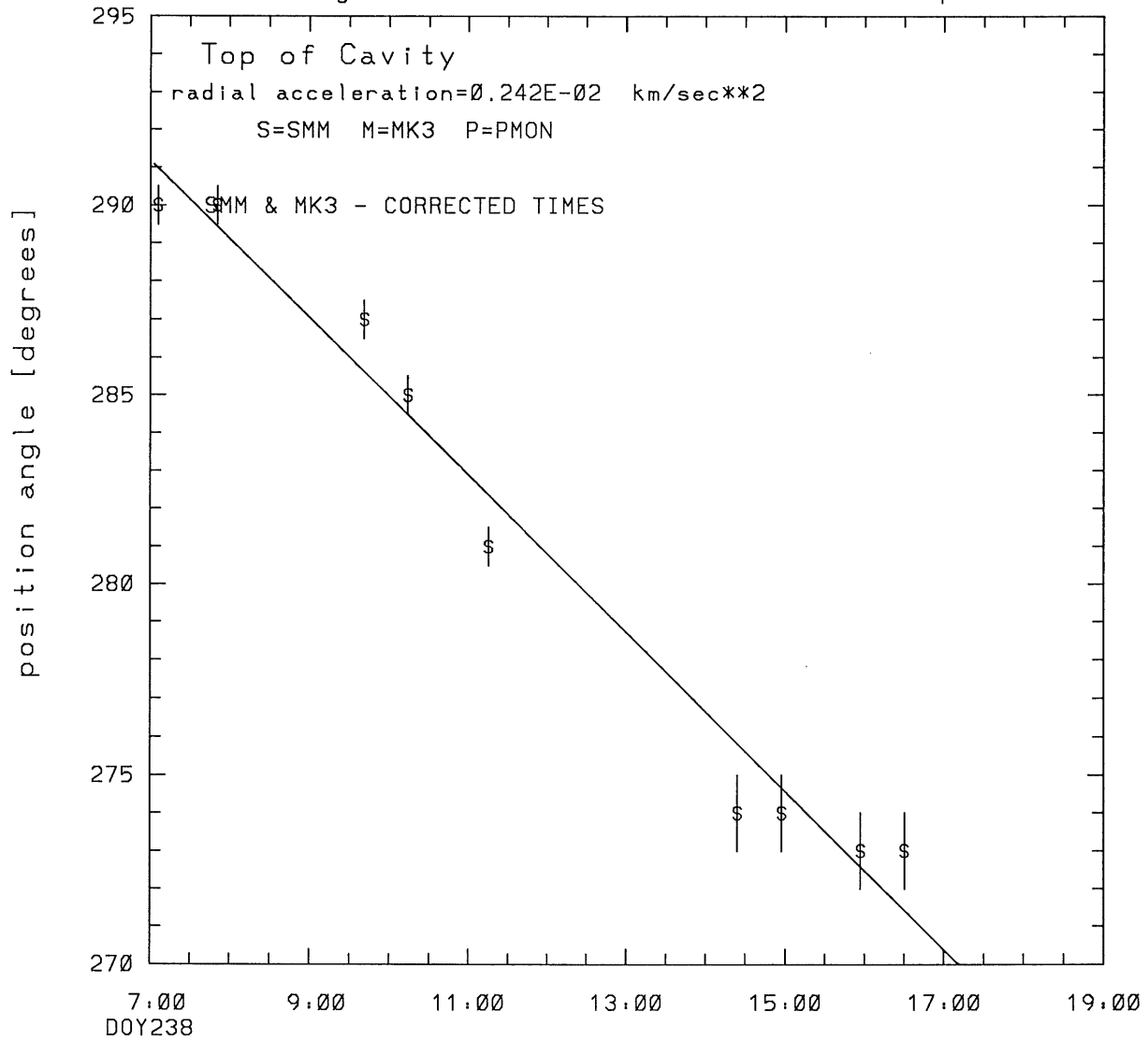


tstart=DOY238 5:41 from derivative=0  
Event begins at 1.94 Solar Radii  
radial acceleration =  $0.0024 \pm 0.0003$  [km/sec\*\*2]

SMM C/P 1987 DOY238 280 +/- 10 degrees

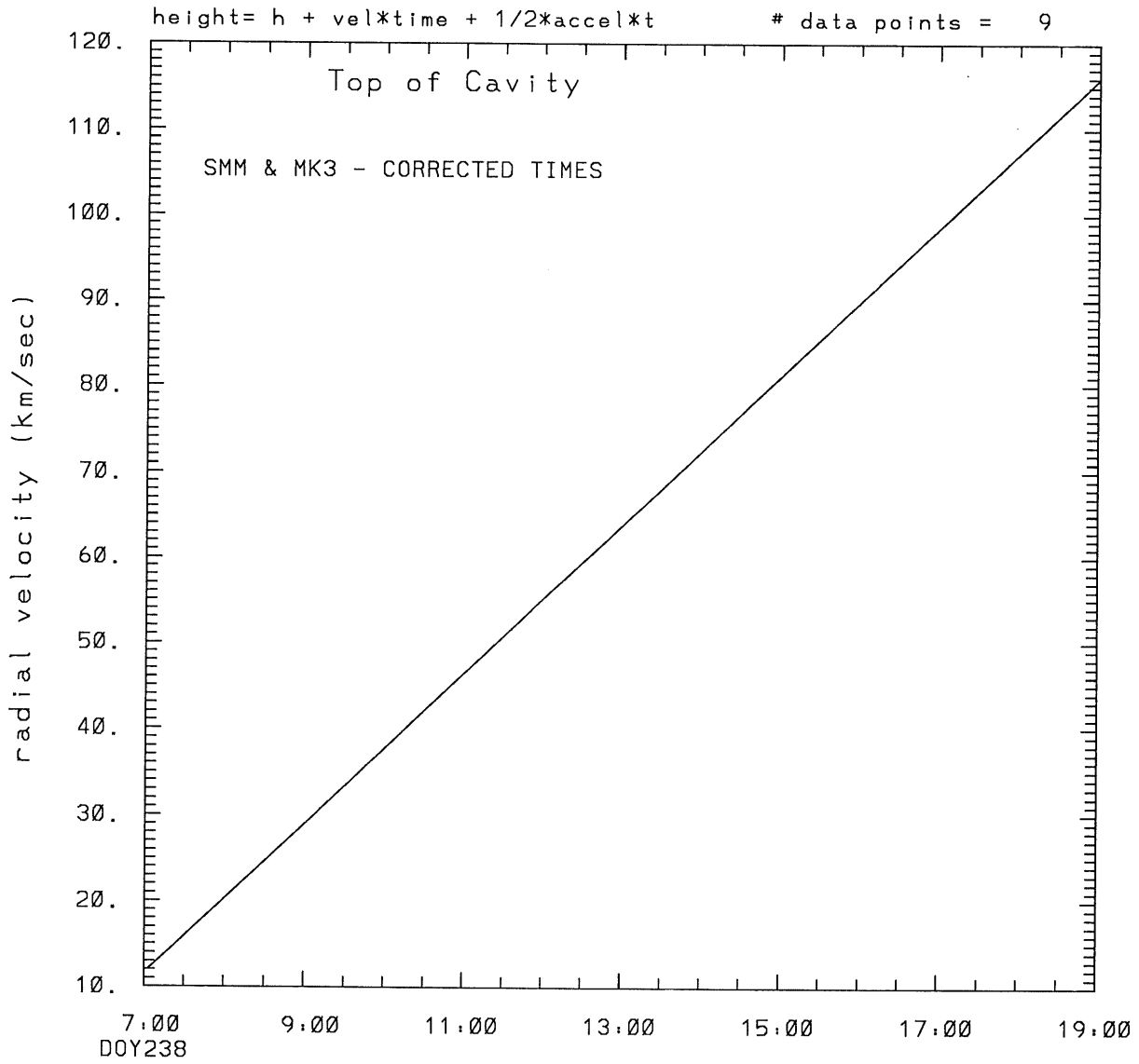
angle = initial angle + angular velocity\*time  
+ 1/2 angular acceleration\*time\*\*2

# data points = 9



tstart=DOY238 5:41 from derivative=0  
angular acceleration=-.384E-11 +/-0.135E-09 [rad/sec\*\*2]

SMM C/P 1987 DOY238 280 +/- 10 degrees

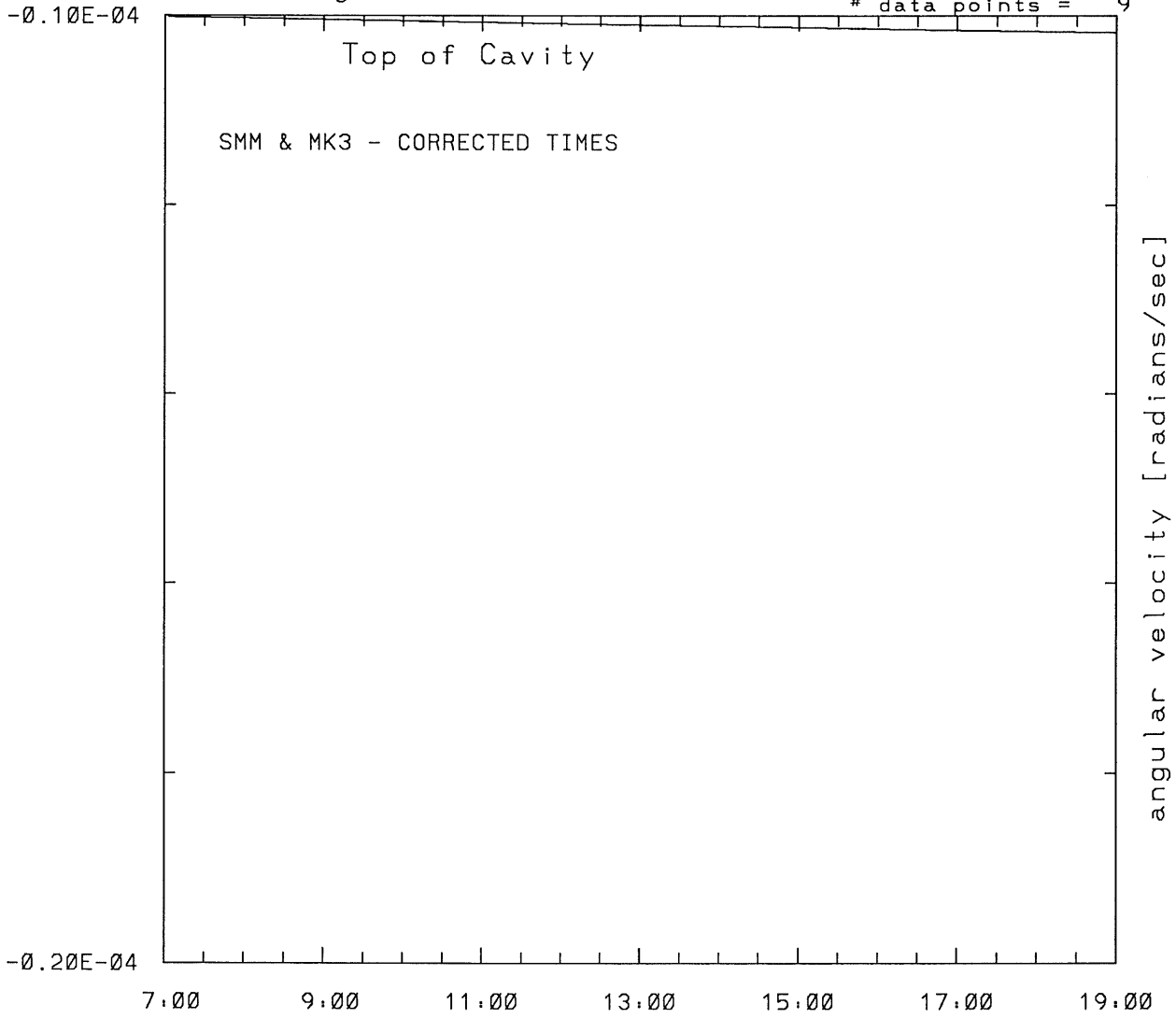


tstart=DOY238 5:41 from derivative=0  
Event begins at 1.94 Solar Radii  
radial acceleration=0.242E-02 km/sec\*\*2

SMM C/P 1987 D0Y238 280 +/- 10 degrees

$$\text{angle} = \text{initial angle} + \text{angular velocity} * \text{time} + \frac{1}{2} \text{angular acceleration} * \text{time} ** 2$$

# data points = 9



D0Y238

tstart=D0Y238 5:41 from derivative=0

angular acceleration=-.384E-11 +/-

0.135E-09 [rad/sec\*\*2]

\*\*\*\*\*  
This is a 1 order run  
\*\*\*\*\*

\*\*\*\*\*  
INPUT:  
\*\*\*\*\*

year	day	time	radii	radius	error in angle	error in angle	datatype
1987	238	7: 5:51	2.00 +/- 0.15	290.0 +/- 0.5		SMM	
1987	238	7:50:25	2.05 +/- 0.15	290.0 +/- 0.5		SMM	
1987	238	9:41: 9	2.25 +/- 0.15	287.0 +/- 0.5		SMM	
1987	238	10:14: 9	2.35 +/- 0.15	285.0 +/- 0.5		SMM	
1987	238	11:15:24	2.75 +/- 0.15	281.0 +/- 0.5		SMM	
1987	238	14:23:59	3.60 +/- 0.20	274.0 +/- 1.0		SMM	
1987	238	14:57:27	3.90 +/- 0.20	274.0 +/- 1.0		SMM	
1987	238	15:57: 9	4.30 +/- 0.20	273.0 +/- 1.0		SMM	
1987	238	16:30: 8	4.60 +/- 0.25	273.0 +/- 1.0		SMM	

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

\*\*\*\*\*  
OUTPUT:  
\*\*\*\*\*

START TIME:

Event began at t = 0 + -0.158E+03 +/- 0.432E+01 [minutes]  
In more convenient units:  
Event began at DOY 238 4:22 +/- 0.432E+01 [minutes]

Origin defined at DOY238 7: 0

RADIAL INFORMATION:

RADIAL VELOCITY = 52. +/- 4. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) = 0.171E+01 +/- 0.108E+00 [solar radii]  
c(2) = 0.450E-02 +/- 0.355E-03 [radii/min]  
c(2) = 0.522E+02 +/- 0.412E+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)= 0.12980E+00 [radii] see Bevington pg. 114  
error in c(2)= 0.35998E-03 [radii/min] see Bevington pg. 114

ANGULAR INFORMATION:

ANGULAR VELOCITY = -0.1007E-04 +/- 0.6720E-06 [radians/sec]

The computed ANGULAR coefficients and errors FROM NLLST2 are:

a(1) = 291. +/- 1. [degrees]  
a(2) = -0.346E-01 +/- 0.231E-02 [degrees/min]  
a(2) = -0.101E-04 +/- 0.672E-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 7: 5 = 52. km/sec

The RADIAL velocity at 7:50 = 52. km/sec  
The RADIAL velocity at 9:41 = 52. km/sec  
The RADIAL velocity at 10:14 = 52. km/sec  
The RADIAL velocity at 11:15 = 52. km/sec  
The RADIAL velocity at 14:23 = 52. km/sec  
The RADIAL velocity at 14:57 = 52. km/sec  
The RADIAL velocity at 15:57 = 52. km/sec  
The RADIAL velocity at 16:30 = 52. km/sec

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

Fit is ok [ier=1]

Standard Deviation in the height = 1.02  
Standard Deviation in start time measurement = 0.201E+03  
Error in time = 0.12735E+03 using best fit method  
See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.392E-01  
Reduced Chi Squared = 0.245E+00  
Chi Squared = 0.172E+01  
The probability for exceeding chi square = 0.100E+01

The correlation coefficient = 0.981E+00  
The probability that no LINEAR correlation exists between the variables = 0.29551  
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]



\*\*\*\*\*  
This is a 2 order run  
\*\*\*\*\*

\*\*\*\*\*  
INPUT:  
\*\*\*\*\*

year	day	time	radii	radius	error in angle	error in angle	datatype
1987	238	7: 5:51	2.00 +/- 0.15	290.0 +/- 0.5	0.5	SMM	
1987	238	7:50:25	2.05 +/- 0.15	290.0 +/- 0.5	0.5	SMM	
1987	238	9:41: 9	2.25 +/- 0.15	287.0 +/- 0.5	0.5	SMM	
1987	238	10:14: 9	2.35 +/- 0.15	285.0 +/- 0.5	0.5	SMM	
1987	238	11:15:24	2.75 +/- 0.15	281.0 +/- 0.5	0.5	SMM	
1987	238	14:23:59	3.60 +/- 0.20	274.0 +/- 1.0	1.0	SMM	
1987	238	14:57:27	3.90 +/- 0.20	274.0 +/- 1.0	1.0	SMM	
1987	238	15:57: 9	4.30 +/- 0.20	273.0 +/- 1.0	1.0	SMM	
1987	238	16:30: 8	4.60 +/- 0.25	273.0 +/- 1.0	1.0	SMM	

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

\*\*\*\*\*  
OUTPUT:  
\*\*\*\*\*

START TIME:

tstart=DOY238 5:41 from derivative = 0  
Event begins at 1.94 Solar Radii  
Origin defined at DOY238 7: 0

RADIAL INFORMATION:

RADIAL ACCELERATION = 0.242E-02 +/- 0.275E-03 km/sec\*\*2

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) = 0.198E+01 +/- 0.449E-01 [solar radii]  
c(2) = 0.998E-03 +/- 0.413E-03 [radii/min]  
c(2) = 0.116E+02 +/- 0.479E+01 [km/sec]  
c(3) = 0.625E-05 +/- 0.710E-06 [radii/min\*\*2]  
c(3) = 0.242E-02 +/- 0.275E-03 [km/sec\*\*2]

The computed ERRORS in coefficients [BEVINGTON] are:

Approximate error in c(1) = 0.49752E-01 [radii] Bevington pg 154 (8-30)  
Exact error in c(1) = 0.46137E-02 [radii] Bevington pg 154 (8-28)  
Approximate error in c(2) = 0.43759E-03 [radii/min] Bevington pg 154 (8-30)  
Exact error in c(2) = 0.93766E-04 [radii/min] Bevington pg 154 (8-28)  
Approximate error in c(3) = 0.72007E-06 [radii/min\*\*2] Bevington pg 154 (8-30)  
Exact error in c(3) = 0.16261E-06 [radii/min\*\*2] Bevington pg 154 (8-28)

ANGULAR INFORMATION:

ANGULAR ACCELERATION= -0.3841E-11 +/- 0.1354E-09[radians/sec\*\*2]

The computed ANGULAR coefficients and errors FROM NLLST2 are:

a(1) = 291. +/- 1. [degrees]  
a(2) = -0.344E-01 +/- 0.783E-02 [degrees/min]  
a(2) = -0.100E-04 +/- 0.228E-05 [rad/sec]  
a(3) = -0.396E-06 +/- 0.140E-04 [degrees/min\*\*2]

$$a(3) = -0.384E-11 \pm 0.135E-09 \text{ [rad/sec**2]}$$

The RADIAL velocity at 7: 5 = 12. km/sec

The RADIAL velocity at 7:50 = 19. km/sec

The RADIAL velocity at 9:41 = 35. km/sec

The RADIAL velocity at 10:14 = 40. km/sec

The RADIAL velocity at 11:15 = 49. km/sec

The RADIAL velocity at 14:23 = 76. km/sec

The RADIAL velocity at 14:57 = 81. km/sec

The RADIAL velocity at 15:57 = 89. km/sec

The RADIAL velocity at 16:30 = 94. km/sec

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

Fit is ok [ier=1]

Standard Deviation in the height = 1.02

Standard Deviation in start time measurement = 0.201E+03

Value of reduced Chi Squared returned from nllst2 = 0.371E-02

Reduced Chi Squared = 0.179E-01

Chi Squared = 0.108E+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 = 0.9505E+00

The correlation between the data and the time\*\*2 term = 0.9358E+00

The correlation between the data and the complete equation of motion=0.9968E+00

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