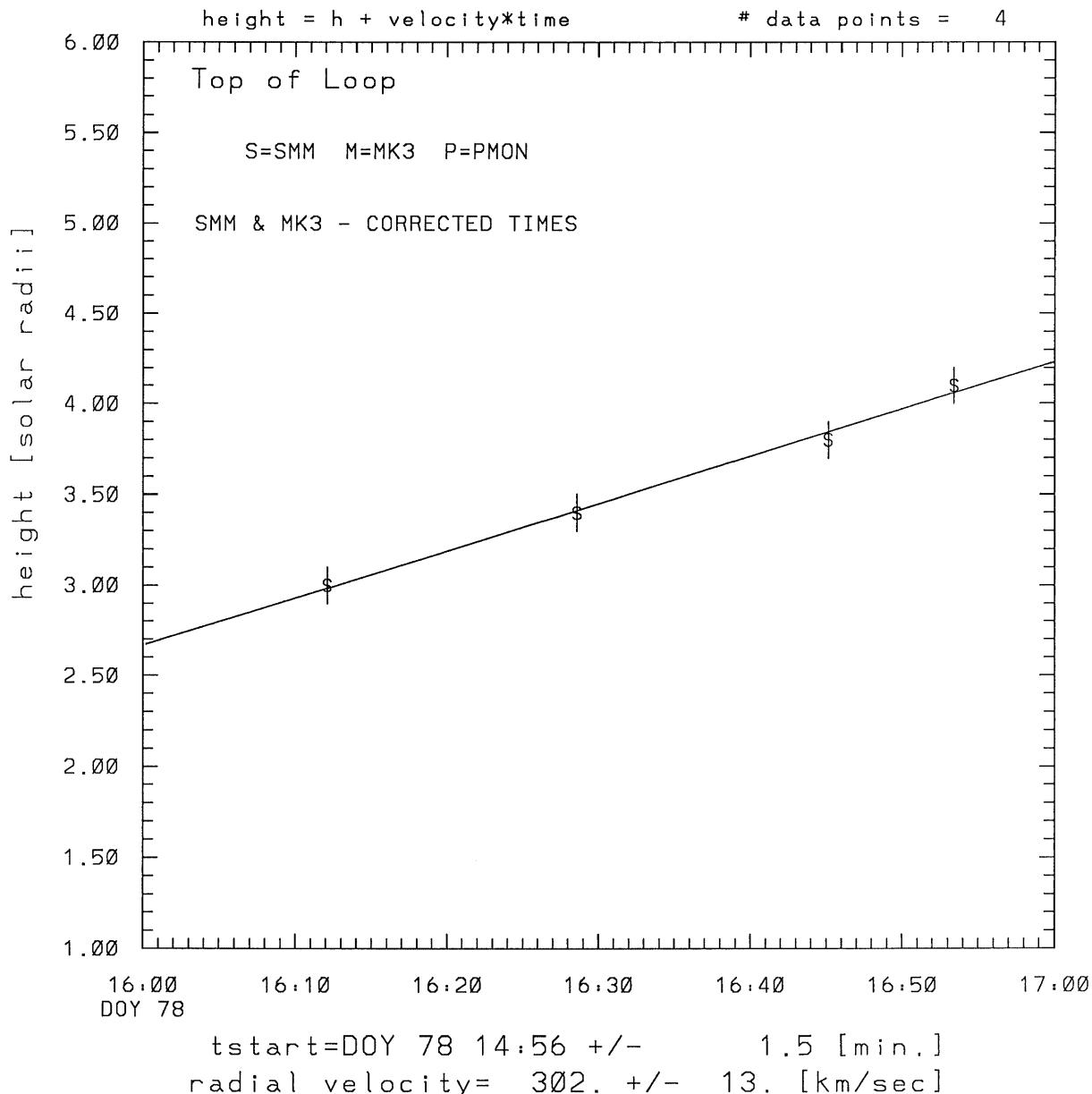
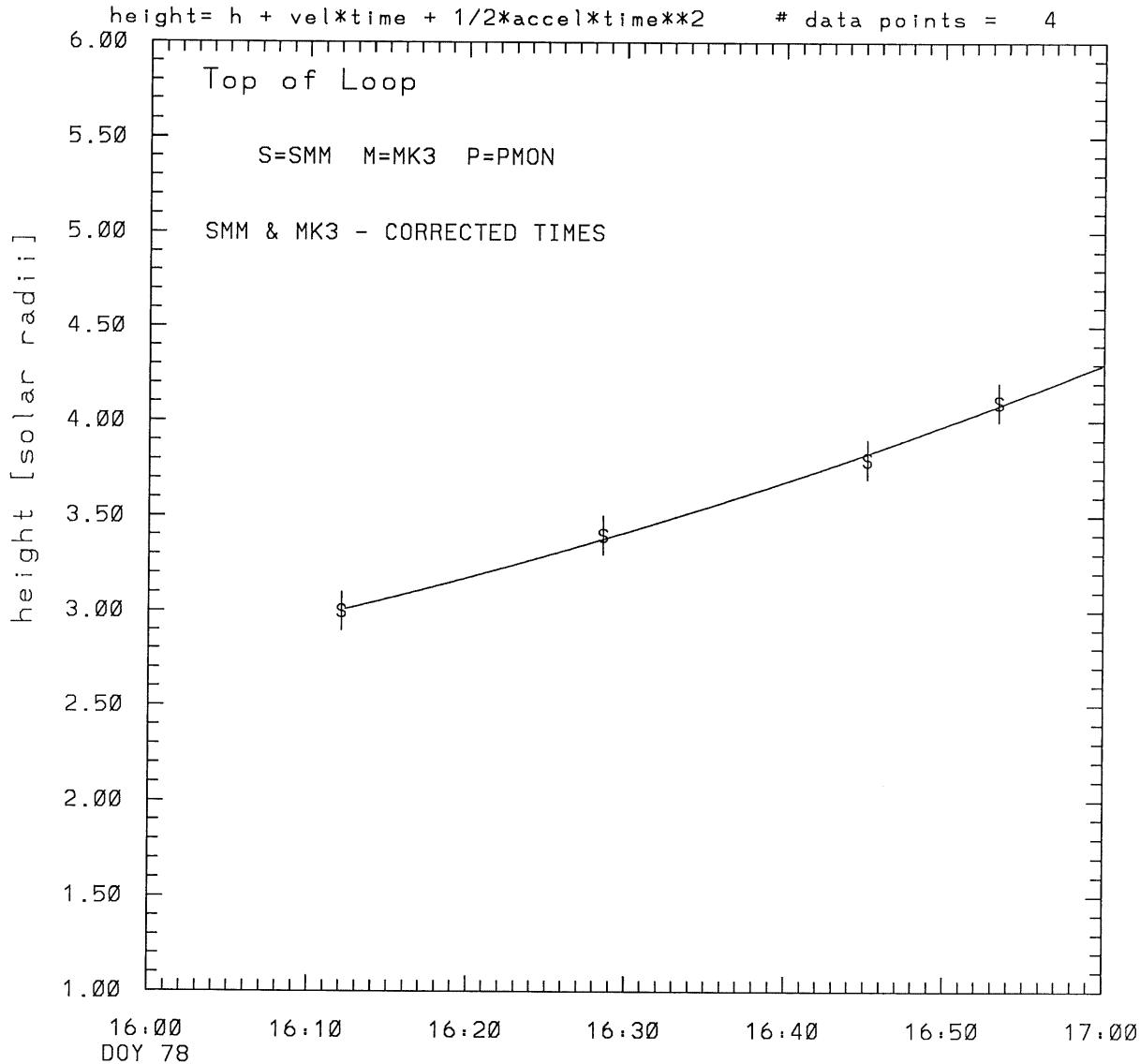


SMM C/P 1989 DOY 78 250 +/- 0 degrees

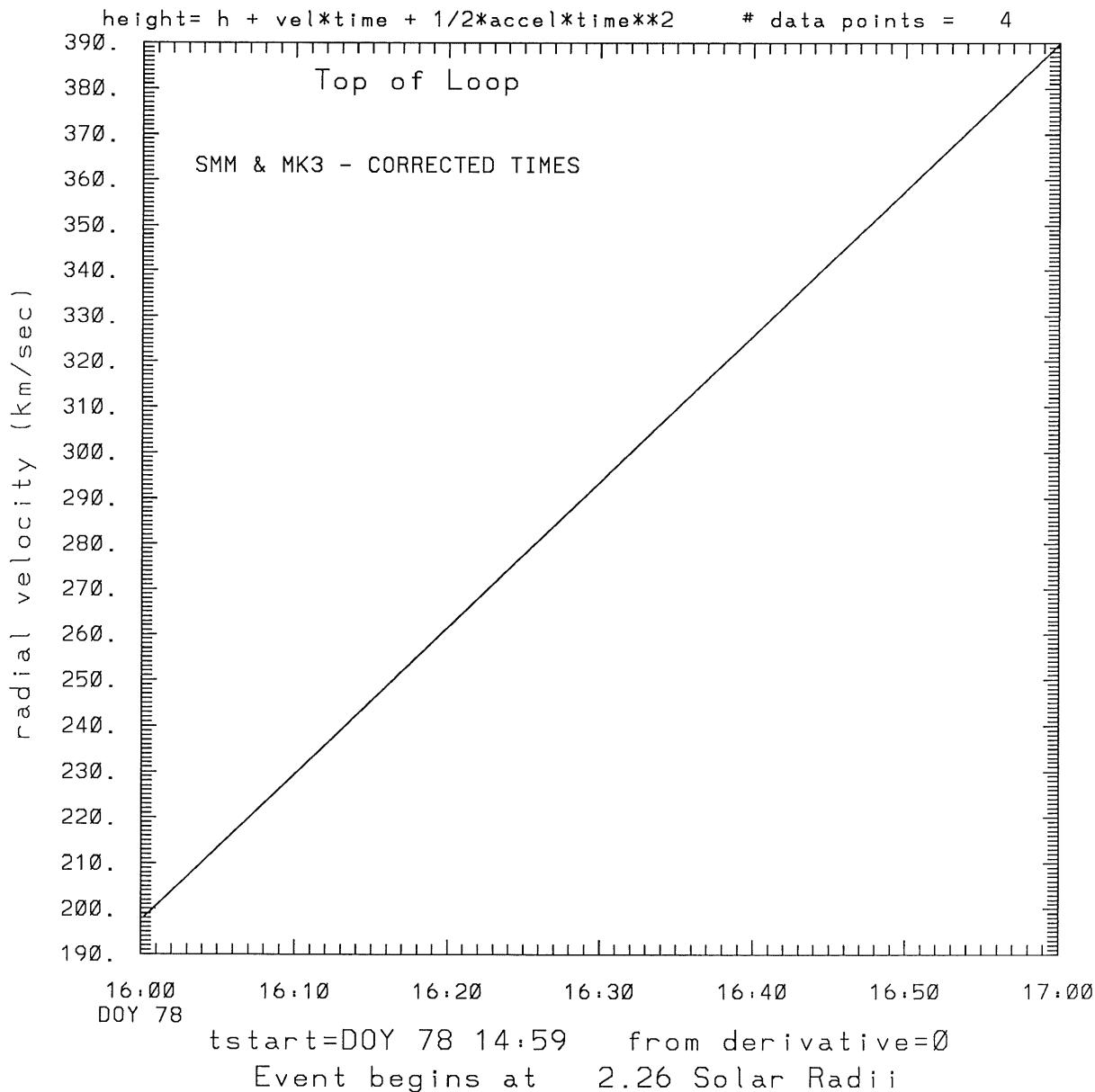


SMM C/P 1989 DOY 78 250 +/- 0 degrees



tstart=DOY 78 14:59 from derivative=0
Event begins at 2.26 Solar Radii
radial acceleration= 0.0534 +/- 0.0312 [km/sec**2]

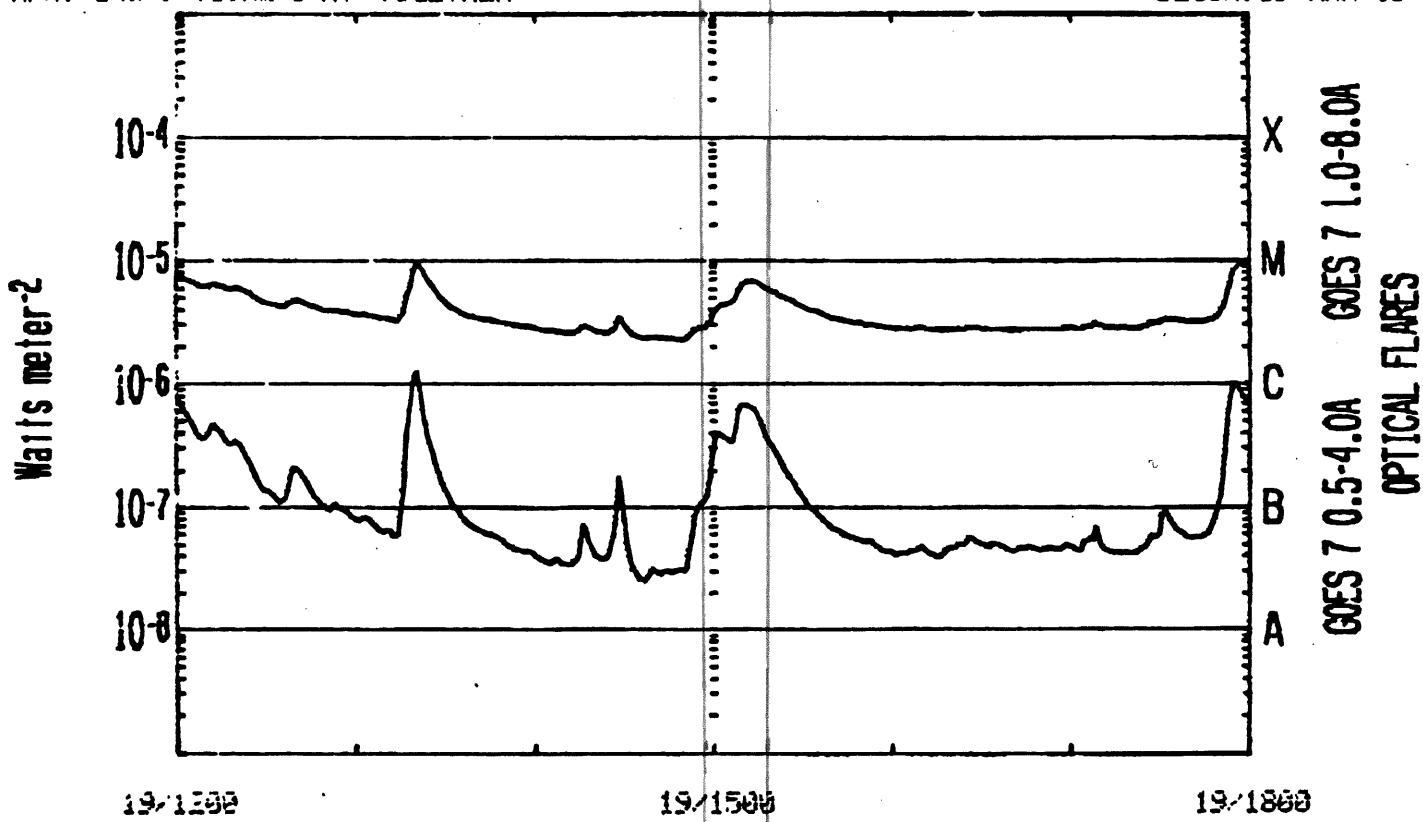
SMM C/P 1989 DOY 78 250 +/- 0 degrees



1989 Day 578

ARMY AND OPTICAL DATA TOGETHER

BEGIN: 19 MAR 89



GOES-7 1 MIN DATA: OPTICAL FLARE DUR. IMP. REGION

BUN: 165UT
22 MAR 89

SAA'S
NIGHT

This is a 1 order run

INPUT:

year	doy	time	radii	radius	angle	angle	datatype
1989	78	16:12: 5	3.00	+/- 0.10	250.0	+/- 0.5	SMM
1989	78	16:28:35	3.40	+/- 0.10	250.0	+/- 0.5	SMM
1989	78	16:45: 9	3.80	+/- 0.10	250.0	+/- 0.5	SMM
1989	78	16:53:25	4.10	+/- 0.10	250.0	+/- 0.5	SMM

Structure being measured:

Top of Loop

OUTPUT:

START TIME:

Event began at t = 0 + -0.641E+02 +/- 0.154E+01 [minutes]

In more convenient units:

Event began at DOY 78 14:56 +/- 0.154E+01 [minutes]

Origin defined at DOY 78 16: 0

RADIAL INFORMATION:

RADIAL VELOCITY = 302, +/- 13. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) = 0.267E+01 +/- 0.442E-01 [solar radii]
c(2) = 0.260E-01 +/- 0.116E-02 [radii/min]
c(2) = 0.302E+03 +/- 0.134E+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)= 0.54181E-01 [radii] see Bevington pg. 114

error in c(2)= 0.14162E-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) = 250. +/- 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 16:12 = 0. km/sec
The TOTAL velocity at 16:12 = 302. km/sec

The TANGENTIAL velocity at 16:28 = 0. km/sec
The TOTAL velocity at 16:28 = 302. km/sec

The TANGENTIAL velocity at 16:45 = 0. km/sec
The TOTAL velocity at 16:45 = 302. km/sec

The TANGENTIAL velocity at 16:53 = 0. km/sec
The TOTAL velocity at 16:53 = 302. km/sec

The following info is for estimating goodness of the fit

Fit is ok [ier=1]

Standard Deviation in the height = 0.48
Standard Deviation in start time measurement = 0.159E+02
Error in time = 0.24429E+01 using best fit method
See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.135E-02
Reduced Chi Squared = 0.653E-02
Chi Squared = 0.131E-01
The probability for exceeding chi square = 0.999E+00

The correlation coefficient = 0.997E+00
The probability that no LINEAR correlation exists between the variables = 0.2946E-02
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]

This is a 2 order run

INPUT:

year	doy	time	radii	radius	error in radii	angle	error in angle	datatype
1989	78	16:12: 5	3.00	+/- 0.10	250.0	+/- 0.5	SMM	
1989	78	16:28:35	3.40	+/- 0.10	250.0	+/- 0.5	SMM	
1989	78	16:45: 9	3.80	+/- 0.10	250.0	+/- 0.5	SMM	
1989	78	16:53:25	4.10	+/- 0.10	250.0	+/- 0.5	SMM	

Structure being measured:

Top of Loop

OUTPUT:

START TIME:

tstart=DOY 78 14:59 from derivative = 0

Event begins at 2.26 Solar Radii

Origin defined at DOY 78 16: 0

RADIAL INFORMATION:

RADIAL ACCELERATION = 0.534E-01 +/- 0.312E-01 km/sec**2

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) = 0.278E+01 +/- 0.737E-01 [solar radii]

c(2) = 0.170E-01 +/- 0.534E-02 [radii/min]

c(2) = 0.197E+03 +/- 0.620E+02 [km/sec]

c(3) = 0.138E-03 +/- 0.807E-04 [radii/min**2]

c(3) = 0.534E-01 +/- 0.312E-01 [km/sec**2]

The computed ERRORS in coefficients [BEVINGTON] are:

Approximate error in c(1) = 0.10426E+00 [radii] Bevington pg 154 (8-30)

Exact error in c(1) = 0.33236E-01 [radii] Bevington pg 154 (8-28)

Approximate error in c(2) = 0.75570E-02 [radii/min] Bevington pg 154 (8-30)

Exact error in c(2) = 0.31936E-02 [radii/min] Bevington pg 154 (8-28)

Approximate error in c(3) = 0.11420E-03 [radii/min**] Bevington pg 154 (8-30)

Exact error in c(3) = 0.50386E-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) = 250. +/- 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 16:12 = 0. km/sec

The TOTAL velocity at 16:12 = 236. km/sec

The TANGENTIAL velocity at 16:28 = 0. km/sec

The TOTAL velocity at 16:28 = 289. km/sec

The TANGENTIAL velocity at 16:45 = 0. km/sec

The TOTAL velocity at 16:45 = 342. km/sec

The TANGENTIAL velocity at 16:53 = 0. km/sec

The TOTAL velocity at 16:53 = 369. km/sec

The following info is for estimating goodness of the fit

Fit is ok [ier=1]

Standard Deviation in the height = 0.48

Standard Deviation in start time measurement = 0.159E+02

Value of reduced Chi Squared returned from nllst2 = 0.821E-03

Reduced Chi Squared = 0.470E-02

Chi Squared = 0.470E-02

The probability for exceeding chi square = 0.977E+00

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 = 0.9971E+00

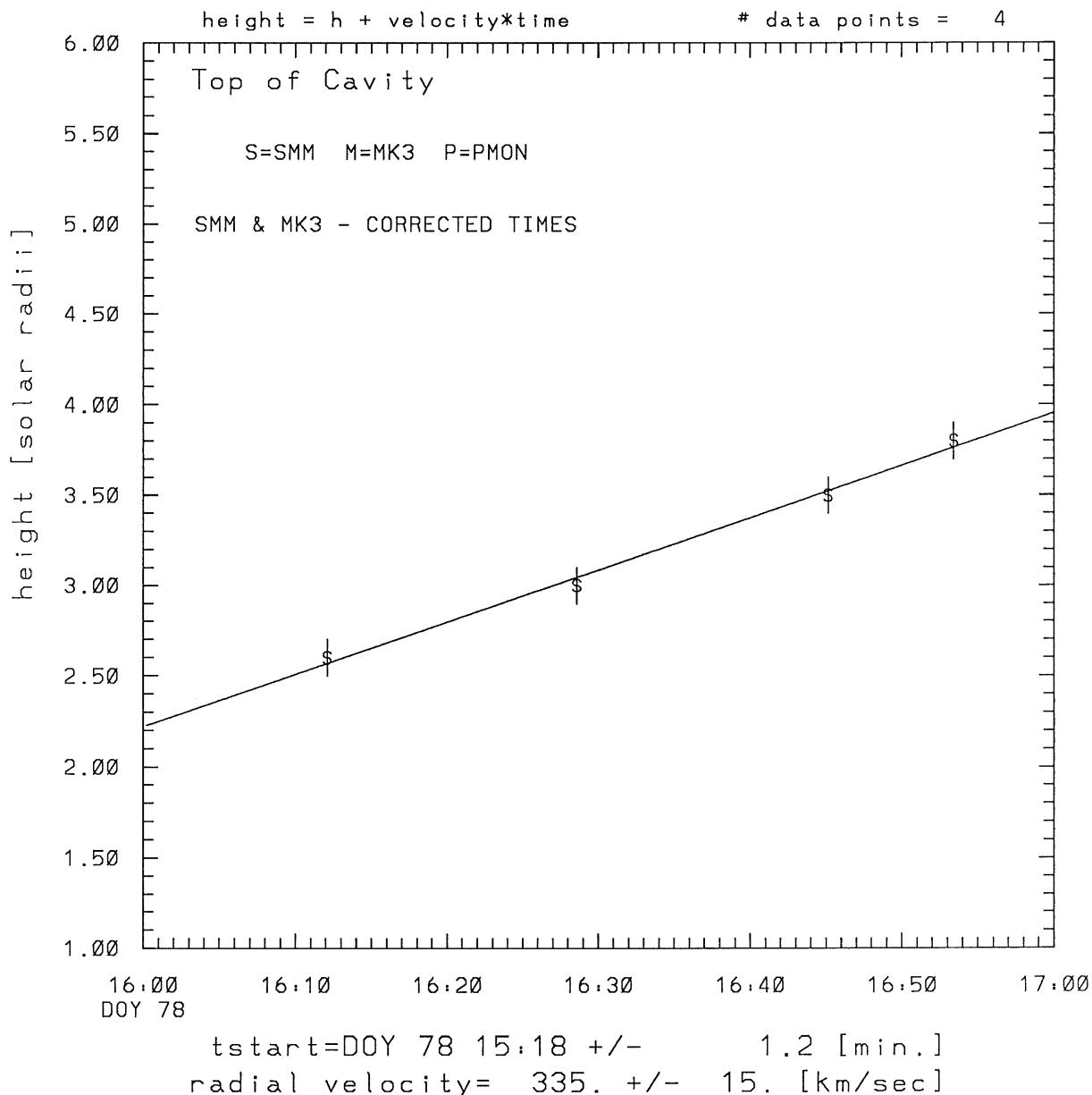
The correlation between the data and the time **2 term = 0.9927E+00

The correlation between the data and the complete equation of motion = 0.9976E+00

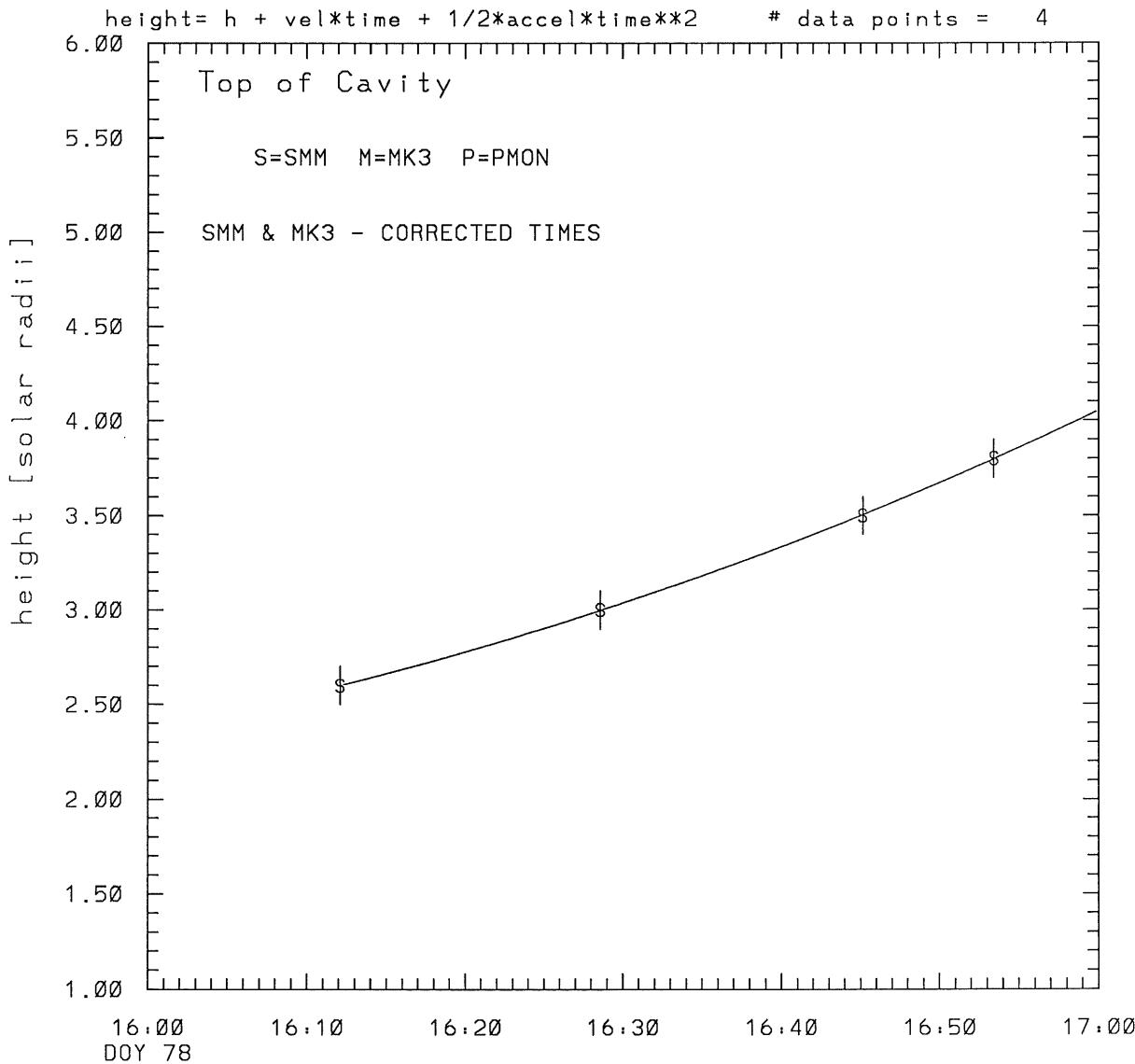
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]



SMM C/P 1989 DOY 78 250 +/- 0 degrees

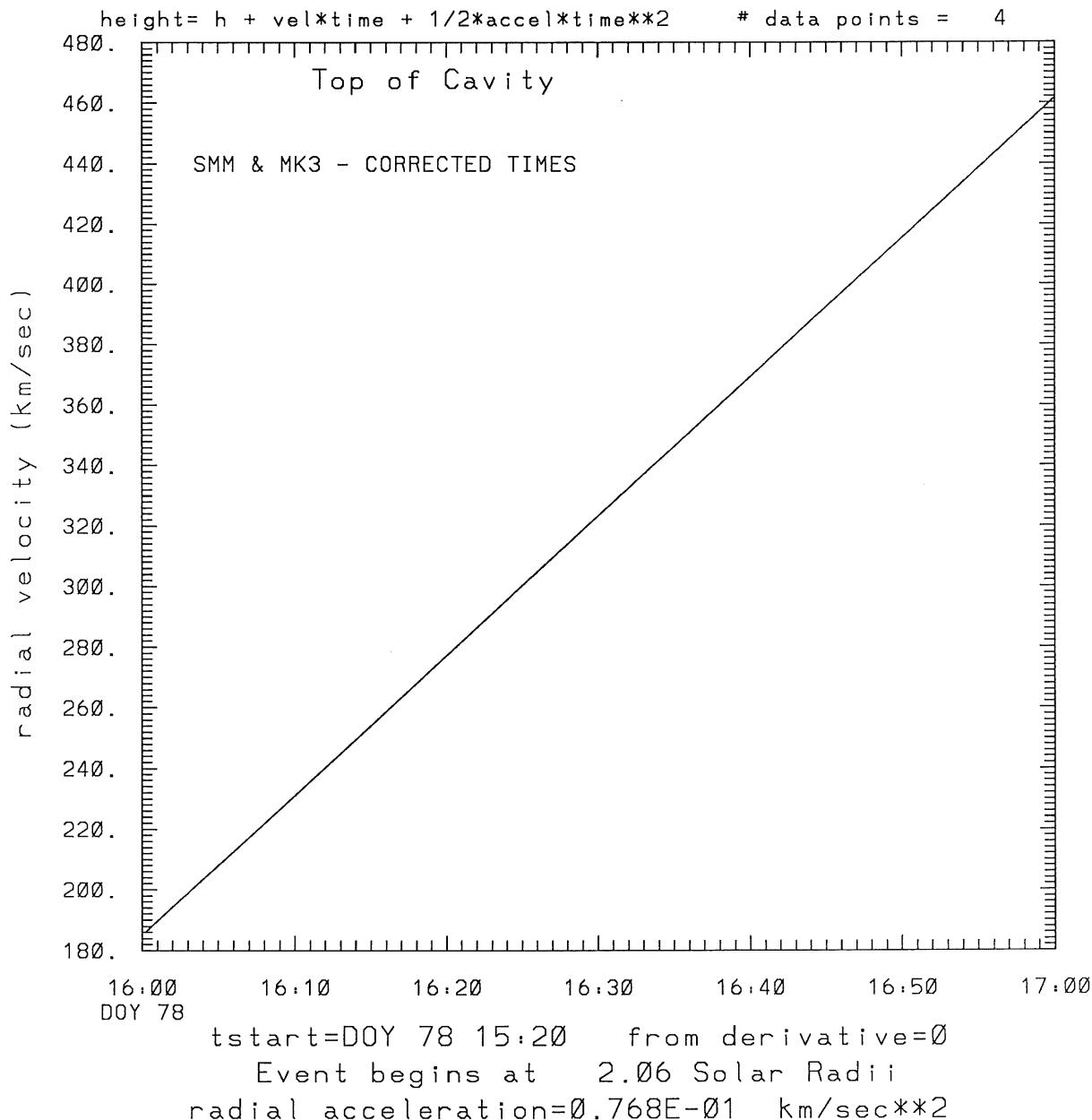


SMM C/P 1989 DOY 78 250 +/- 0 degrees



tstart=DOY 78 15:20 from derivative=0
Event begins at 2.06 Solar Radii
radial acceleration= 0.0768 +/- 0.0042 [km/sec**2]

SMM C/P 1989 DOY 78 250 +/- 0 degrees



This is a 1 order run

INPUT:

year	doy	time	radii	radius	error in radii	error in radius	angle	angle	datatype
1989	78	16:12: 5	2.60	+/- 0.10	250.0	+/- 0.5	250.0	+/- 0.5	SMM
1989	78	16:28:35	3.00	+/- 0.10	250.0	+/- 0.5	250.0	+/- 0.5	SMM
1989	78	16:45: 9	3.50	+/- 0.10	250.0	+/- 0.5	250.0	+/- 0.5	SMM
1989	78	16:53:25	3.80	+/- 0.10	250.0	+/- 0.5	250.0	+/- 0.5	SMM

Structure being measured:

Top of Cavity

OUTPUT:

START TIME:

Event began at t = 0 + -0.422E+02 +/- 0.119E+01 [minutes]

In more convenient units:

Event began at DOY 78 15:18 +/- 0.119E+01 [minutes]

Origin defined at DOY 78 16: 0

RADIAL INFORMATION:

RADIAL VELOCITY = 335. +/- 15. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) = 0.222E+01 +/- 0.492E-01 [solar radii]

c(2) = 0.289E-01 +/- 0.129E-02 [radii/min]

c(2) = 0.335E+03 +/- 0.149E+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)= 0.60223E-01 [radii] see Bevington pg. 114

error in c(2)= 0.15741E-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) = 250. +/- 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 16:12 = 0. km/sec
The TOTAL velocity at 16:12 = 335. km/sec

The TANGENTIAL velocity at 16:28 = 0. km/sec
The TOTAL velocity at 16:28 = 335. km/sec

The TANGENTIAL velocity at 16:45 = 0. km/sec
The TOTAL velocity at 16:45 = 335. km/sec

The TANGENTIAL velocity at 16:53 = 0. km/sec
The TOTAL velocity at 16:53 = 335. km/sec

The following info is for estimating goodness of the fit

Fit is ok [ier=1]

Standard Deviation in the height = 0.53
Standard Deviation in start time measurement = 0.159E+02
Error in time = 0.24456E+01 using best fit method
See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.167E-02
Reduced Chi Squared = 0.615E-02
Chi Squared = 0.123E-01
The probability for exceeding chi square = 0.998E+00

The correlation coefficient = 0.997E+00
The probability that no LINEAR correlation exists between the variables = 0.2948E-02
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]

This is a 2 order run

INPUT:

year	doy	time	radii	radius	error in radii	angle	error in angle	datatype
1989	78	16:12: 5	2.60	+/- 0.10	250.0	+/- 0.5	SMM	
1989	78	16:28:35	3.00	+/- 0.10	250.0	+/- 0.5	SMM	
1989	78	16:45: 9	3.50	+/- 0.10	250.0	+/- 0.5	SMM	
1989	78	16:53:25	3.80	+/- 0.10	250.0	+/- 0.5	SMM	

Structure being measured:

Top of Cavity

OUTPUT:

START TIME:

tstart=DOY 78 15:20 from derivative = 0

Event begins at 2.06 Solar Radii

Origin defined at DOY 78 16: 0

RADIAL INFORMATION:

RADIAL ACCELERATION = 0.768E-01 +/- 0.421E-02 km/sec**2

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) = 0.238E+01 +/- 0.995E-02 [solar radii]
c(2) = 0.159E-01 +/- 0.721E-03 [radii/min]
c(2) = 0.185E+03 +/- 0.837E+01 [km/sec]
c(3) = 0.199E-03 +/- 0.109E-04 [radii/min**2]
c(3) = 0.768E-01 +/- 0.421E-02 [km/sec**2]

The computed ERRORS in coefficients [BEVINGTON] are:

Approximate error in c(1) = 0.14072E-01 [radii] Bevington pg 154 (8-30)

Exact error in c(1) = 0.44859E-02 [radii] Bevington pg 154 (8-28)

Approximate error in c(2) = 0.10200E-02 [radii/min] Bevington pg 154 (8-30)

Exact error in c(2) = 0.43107E-03 [radii/min] Bevington pg 154 (8-28)

Approximate error in c(3) = 0.15414E-04 [radii/min**] Bevington pg 154 (8-30)

Exact error in c(3) = 0.68011E-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) = 250. +/- 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 16:12 = 0. km/sec

The TOTAL velocity at 16:12 = 241. km/sec

The TANGENTIAL velocity at 16:28 = 0. km/sec

The TOTAL velocity at 16:28 = 317. km/sec

The TANGENTIAL velocity at 16:45 = 0. km/sec

The TOTAL velocity at 16:45 = 393. km/sec

The TANGENTIAL velocity at 16:53 = 0. km/sec

The TOTAL velocity at 16:53 = 431. km/sec

The following info is for estimating goodness of the fit

Fit is ok [ier=1]

Standard Deviation in the height = 0.53

Standard Deviation in start time measurement = 0.159E+02

Value of reduced Chi Squared returned from nllst2 = 0.150E-04

Reduced Chi Squared = 0.857E-04

Chi Squared = 0.857E-04

The probability for exceeding chi square = 0.997E+00

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 = 0.9970E+00

The correlation between the data and the t^{**2} term = 0.9957E+00

The correlation between the data and the complete equation of motion = 0.1000E+01

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