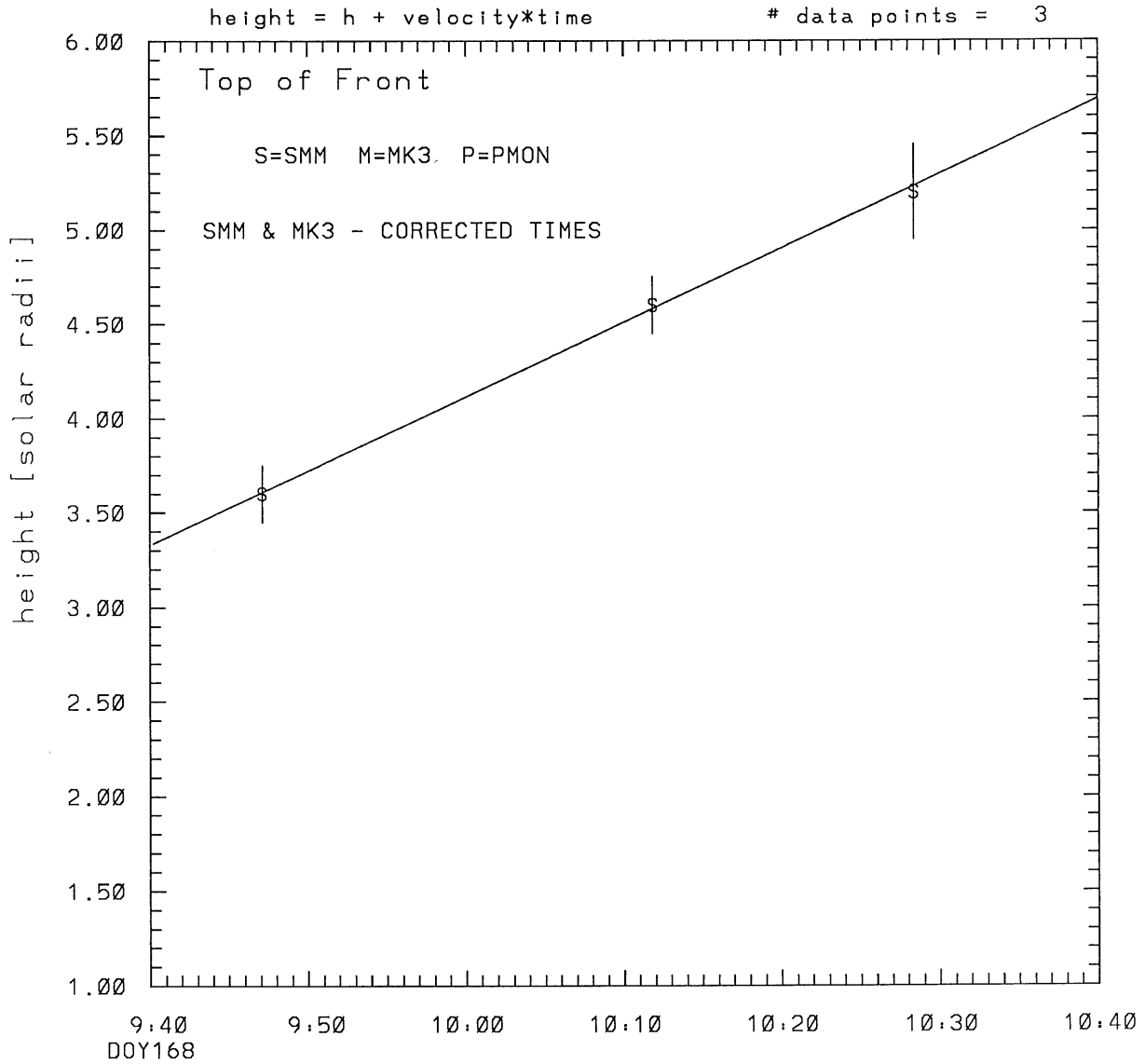
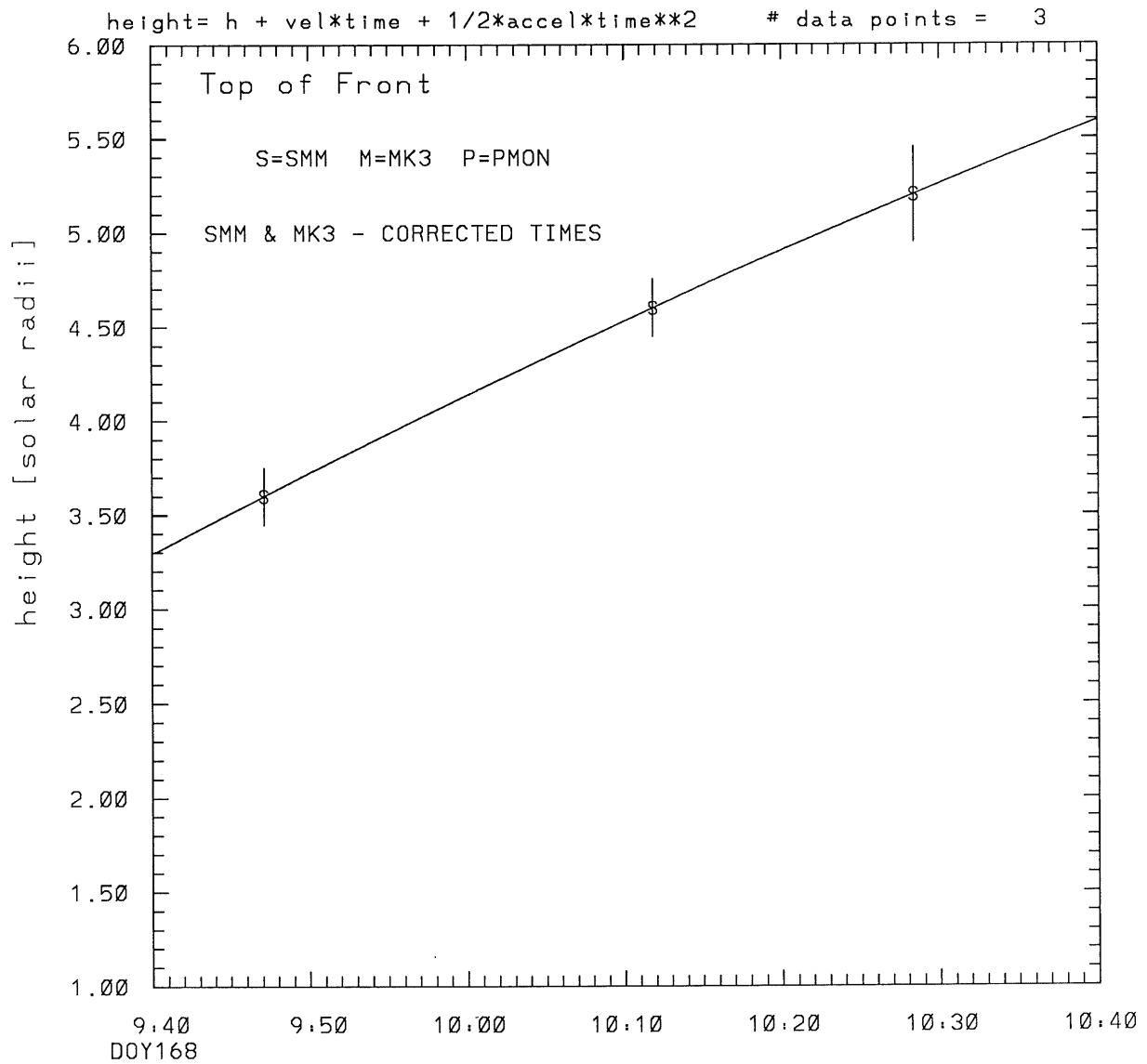


SMM C/P 1989 DOY168 270 +/- 0 degrees



tstart=DOY168 8:41 +/- 0.9 [min.]  
radial velocity= 456. +/- 10. [km/sec]

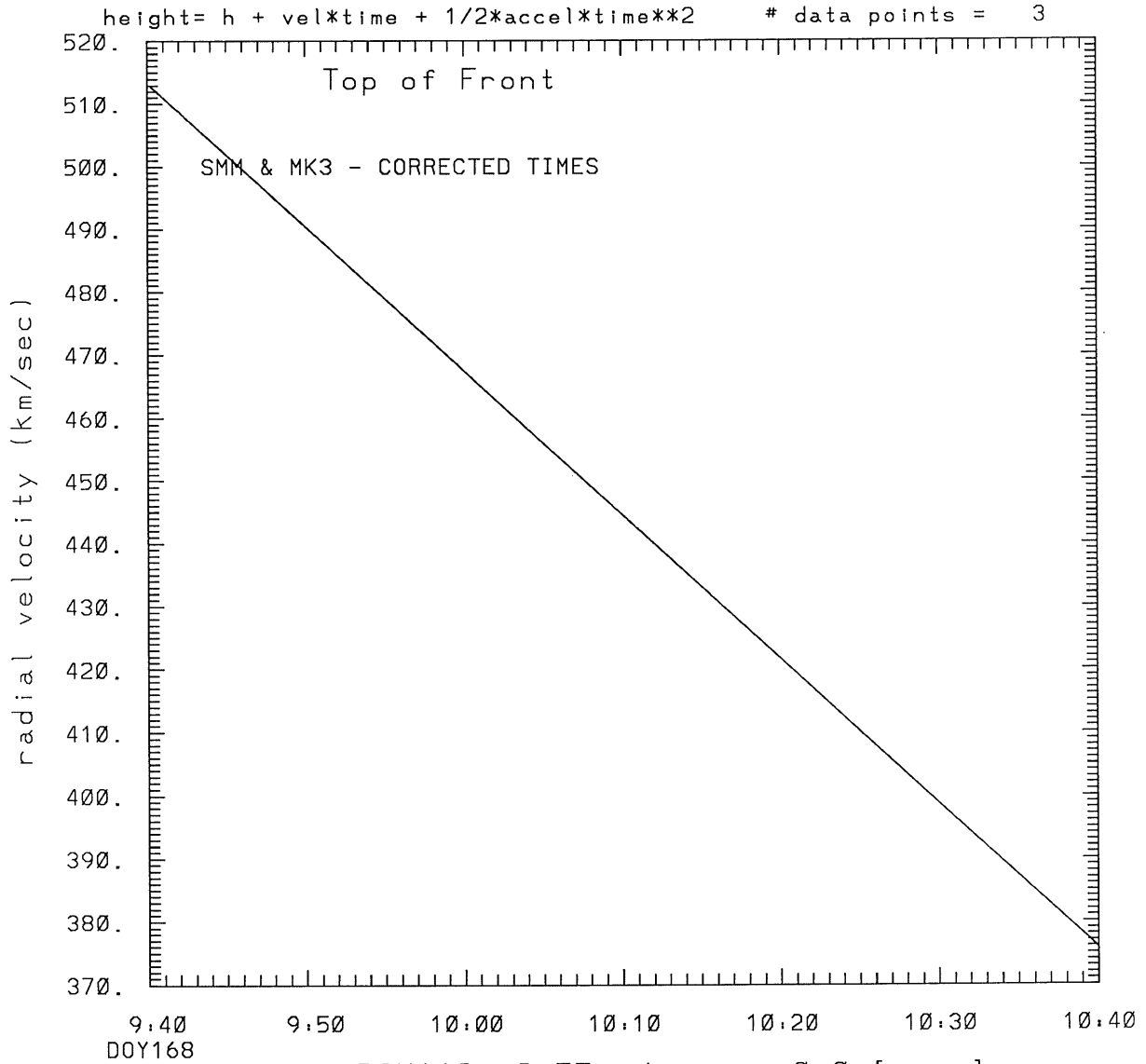
SMM C/P 1989 DOY168 270 +/- 0 degrees



tstart=DOY168 8:55 +/- 0.0 [min.]

radial acceleration=-0.0382 +/- 0.0000 [km/sec\*\*2]

SMM C/P 1989 DOY168 270 +/- 0 degrees



tstart=DOY168 8:55 +/- 0.0 [min.]

radial acceleration =  $-.382E-01$  km/sec\*\*2

\*\*\*\*\*

This is a 1 order run

\*\*\*\*\*

\*\*\*\*\*

INPUT:

\*\*\*\*\*

year	doy	time	radii	radius	error in angle	error in angle	datatype
1989	168	9:47: 6	3.60	+/- 0.15	270.0	+/- 1.0	SMM
1989	168	10:11:51	4.60	+/- 0.15	270.0	+/- 1.0	SMM
1989	168	10:28:22	5.20	+/- 0.25	270.0	+/- 1.0	SMM

\*\*\*\*\*

Structure being measured:

Top of Front

\*\*\*\*\*

\*\*\*\*\*

OUTPUT:

\*\*\*\*\*

START TIME:

Event began at  $t = 0 + -0.592E+02 +/- 0.898E+00$  [minutes]

In more convenient units:

Event began at DOY 168 8:41 +/- 0.898E+00 [minutes]

Origin defined at DOY168 9:40

RADIAL INFORMATION:

RADIAL VELOCITY = 456. +/- 10. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) = 0.333E+01 +/- 0.233E-01 [solar radii]  
c(2) = 0.393E-01 +/- 0.821E-03 [radii/min]  
c(2) = 0.456E+03 +/- 0.952E+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)= 0.42553E-01 [radii] see Bevington pg. 114

error in c(2)= 0.12632E-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) = 270. +/- 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 9:47 = 0. km/sec

The TOTAL velocity at 9:47 = 456. km/sec

The TANGENTIAL velocity at 10:11 = 0. km/sec

The TOTAL velocity at 10:11 = 456. km/sec

The TANGENTIAL velocity at 10:28 = 0. km/sec

The TOTAL velocity at 10:28 = 456. km/sec

\*\*\*\*\*

The following info is for estimating goodness of the fit

\*\*\*\*\*

Fit is ok [ier=1]

Standard Deviation in the height = 0.81

Standard Deviation in start time measurement = 0.170E+02

Error in time = 0.94304E+00 using best fit method

See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.480E-03

Reduced Chi Squared = 0.367E-02

Chi Squared = 0.367E-02

The probability for exceeding chi square = 0.983E+00

The correlation coefficient = 0.100E+01

The probability that no LINEAR correlation exists between the variables = 0.1824E-01

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
1989	168	9:47: 6	3.60	+/- 0.15	270.0	+/- 1.0			SMM
1989	168	10:11:51	4.60	+/- 0.15	270.0	+/- 1.0			SMM
1989	168	10:28:22	5.20	+/- 0.25	270.0	+/- 1.0			SMM

\*\*\*\*\*

Structure being measured:

Top of Front

\*\*\*\*\*

\*\*\*\*\*

OUTPUT:

\*\*\*\*\*

START TIME:

Event began at t = 0 + -0.469E+02 +/- 0.000E+00 [minutes]

In more convenient units:

Event began at DOY 168 8:55 +/- 0.000E+00 [minutes]

Origin defined at DOY168 9:40

RADIAL INFORMATION:

RADIAL ACCELERATION = -0.382E-01 +/- 0.000E+00 km/sec\*\*2

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) = 0.329E+01 +/- 0.000E+00 [solar radii]  
c(2) = 0.443E-01 +/- 0.000E+00 [radii/min]  
c(2) = 0.513E+03 +/- 0.000E+00 [km/sec]  
c(3) = -0.988E-04 +/- 0.000E+00 [radii/min\*\*2]  
c(3) = -0.382E-01 +/- 0.000E+00 [km/sec\*\*2]

ANGULAR INFORMATION:

ANGULAR ACCELERATION= 0.0000E+00 +/- 0.0000E+00[radians/sec\*\*2]

The computed ANGULAR coefficients and errors FROM NLLST2 are:

a(1) = 270. +/- 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]

$$a(3) = 0.000E+00 \pm 0.000E+00 \text{ [rad/sec**2]}$$

THE TANGENTIAL AND TOTAL VELOCITIES AT EACH DATA POINT ARE:

The TANGENTIAL velocity at 9:47 = 0. km/sec

The TOTAL velocity at 9:47 = 497. km/sec

The TANGENTIAL velocity at 10:11 = 0. km/sec

The TOTAL velocity at 10:11 = 440. km/sec

The TANGENTIAL velocity at 10:28 = 0. km/sec

The TOTAL velocity at 10:28 = 402. km/sec

\*\*\*\*\*

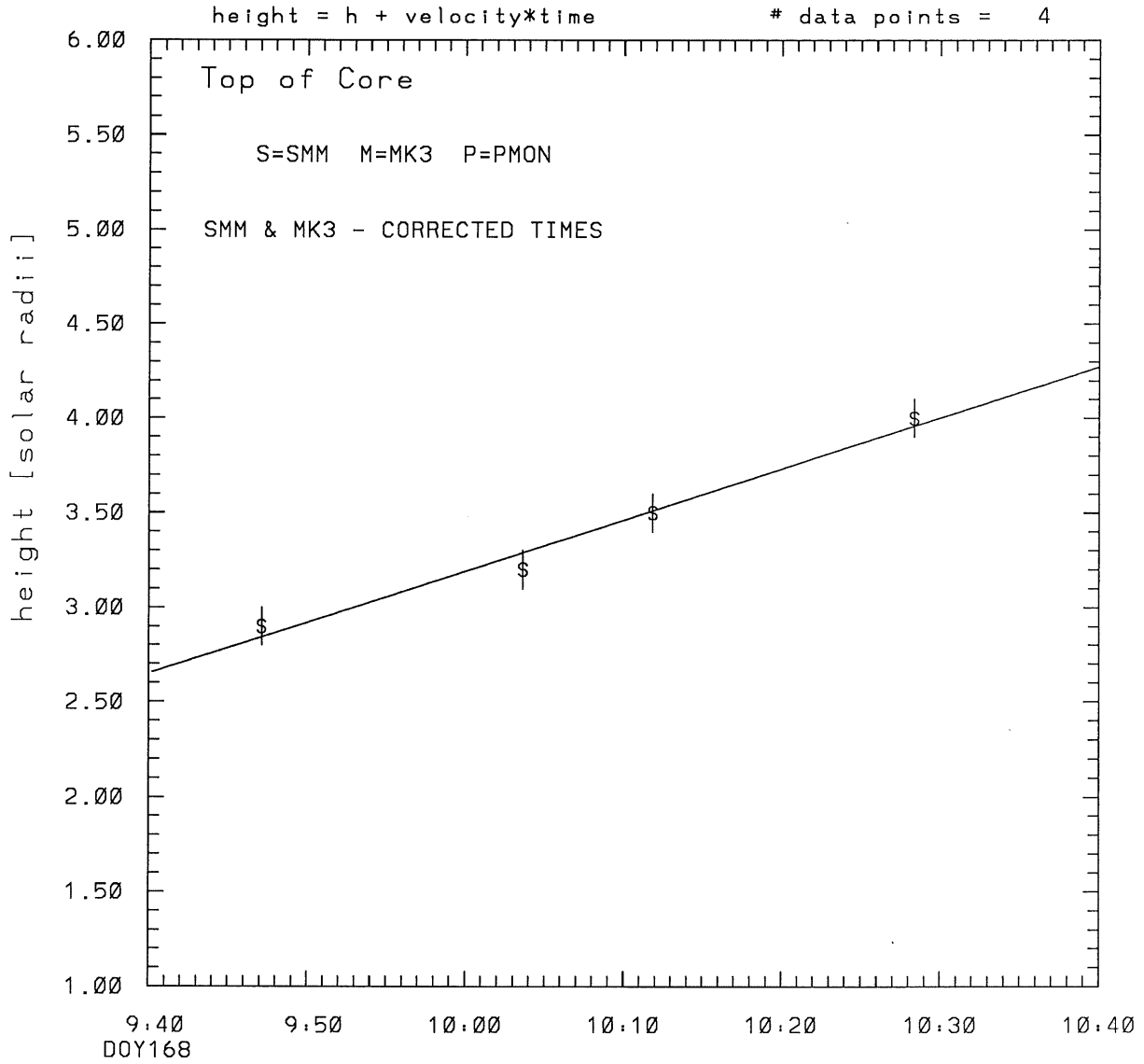
The following info is for estimating goodness of the fit

\*\*\*\*\*

Number data points = number of coefficients. No error analysis is possible.

Correlation coefficient is not computable!

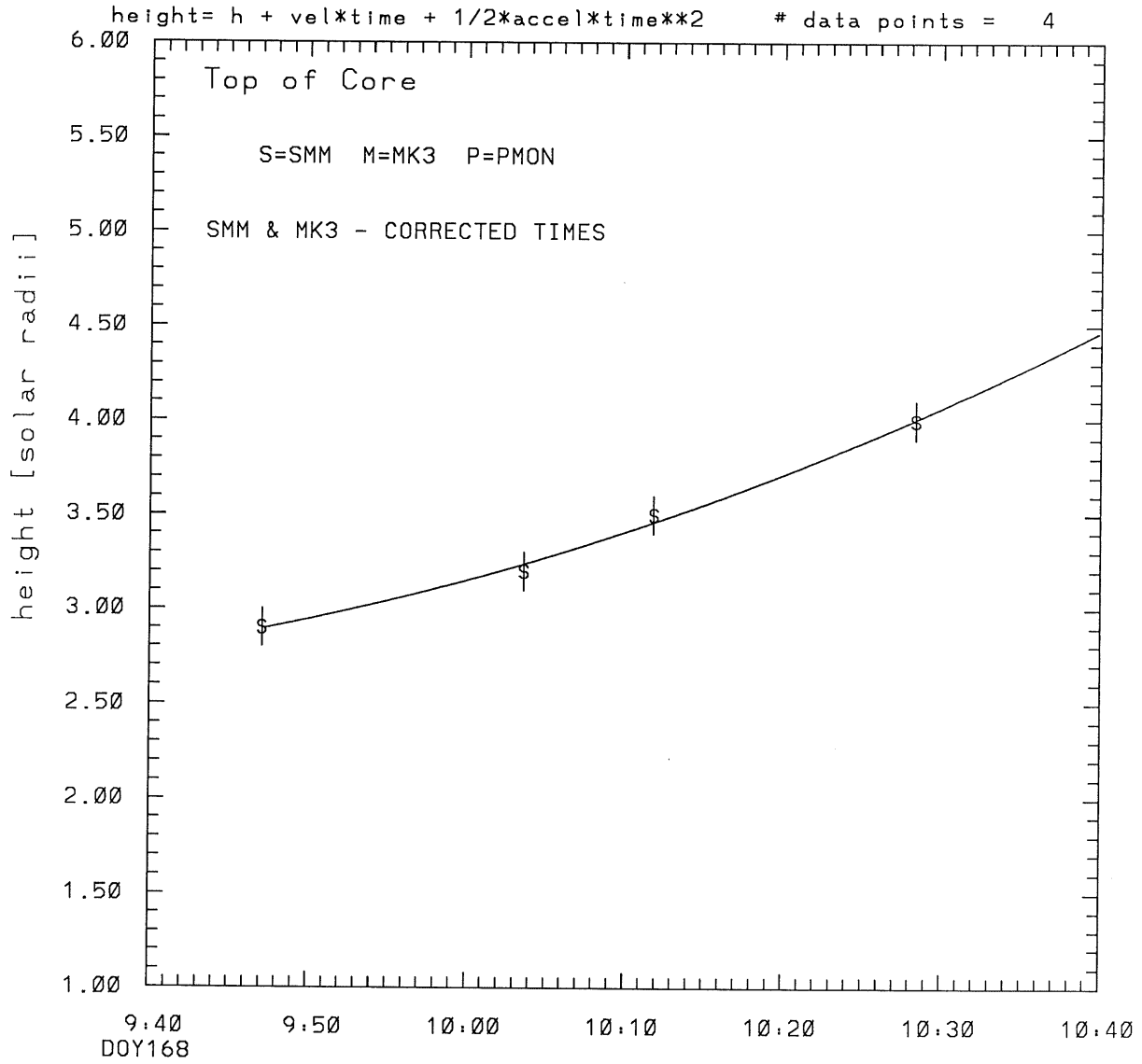
SMM C/P 1989 DOY168 270 +/- 0 degrees



tstart=DOY168 8:39 +/- 2.9 [min.]  
radial velocity= 314. +/- 26. [km/sec]



SMM C/P 1989 DOY168 270 +/- 0 degrees

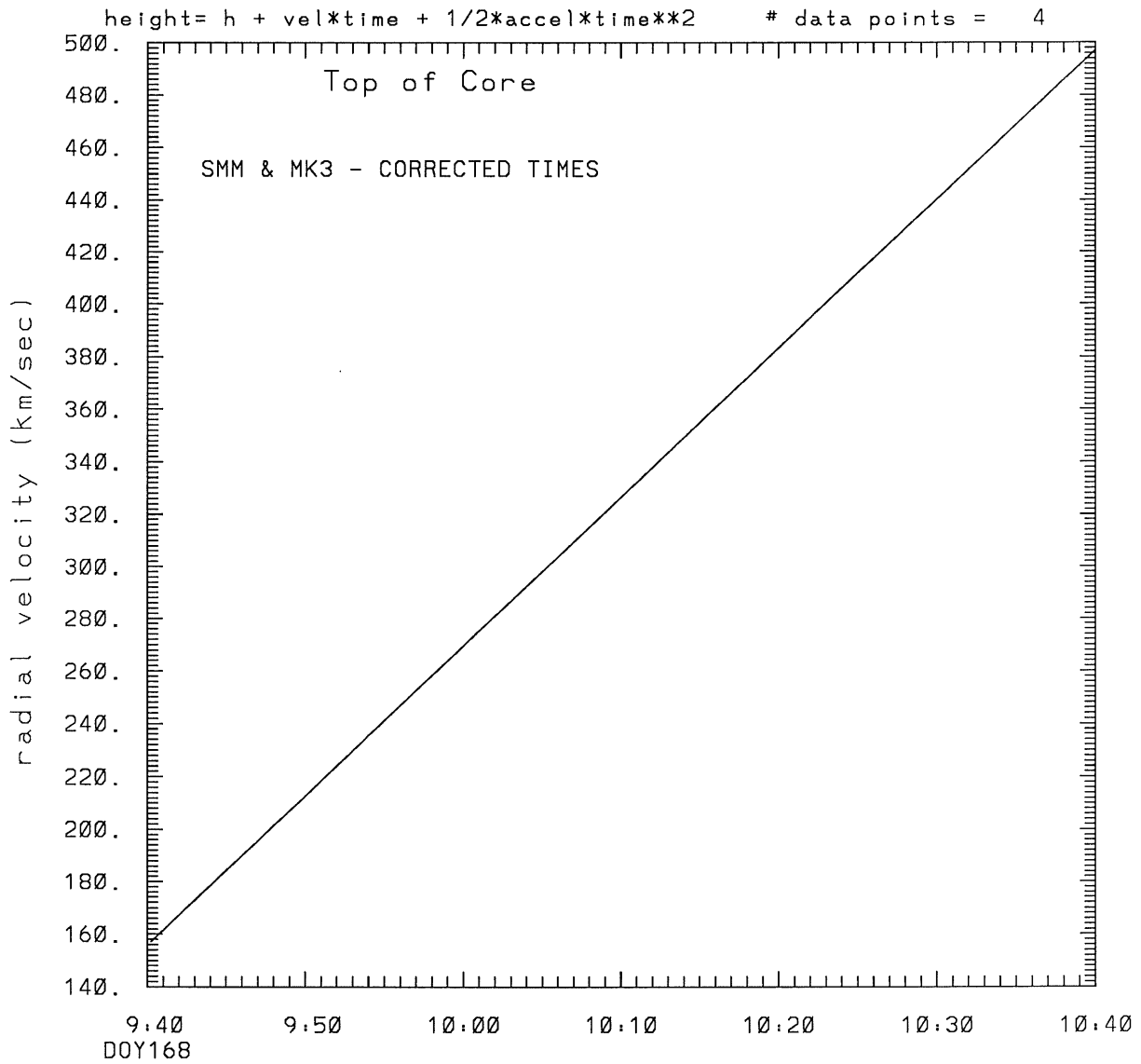


tstart=DOY168 9.13 from derivative=0

Event begins at 2.60 Solar Radii

radial acceleration = 0.0948 +/- 0.0375 [km/sec\*\*2]

SMM C/P 1989 DOY168 270 +/- 0 degrees



tstart=DOY168 9:13 from derivative=0  
Event begins at 2.60 Solar Radii  
radial acceleration=0.948E-01 km/sec\*\*2

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

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

year	doy	time	radii	error in radius	angle	error in angle	datatype
1989	168	9:47: 6	2.90	+/- 0.10	270.0	+/- 1.0	SMM
1989	168	10: 3:38	3.20	+/- 0.10	270.0	+/- 1.0	SMM
1989	168	10:11:51	3.50	+/- 0.10	270.0	+/- 1.0	SMM
1989	168	10:28:22	4.00	+/- 0.10	270.0	+/- 1.0	SMM

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

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

START TIME:

Event began at  $t = 0 + -0.611E+02 +/- 0.287E+01$  [minutes]  
In more convenient units:  
Event began at DOY 168 8:39 +/- 0.287E+01 [minutes]

Origin defined at DOY168 9:40

RADIAL INFORMATION:

RADIAL VELOCITY = 314. +/- 26. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) = 0.265E+01 +/- 0.702E-01 [solar radii]  
c(2) = 0.270E-01 +/- 0.223E-02 [radii/min]  
c(2) = 0.314E+03 +/- 0.259E+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)= 0.85939E-01 [radii] see Bevington pg. 114  
error in c(2)= 0.27304E-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) = 270. +/- 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 9:47 = 0. km/sec

The TOTAL velocity at 9:47 = 314. km/sec

The TANGENTIAL velocity at 10: 3 = 0. km/sec

The TOTAL velocity at 10: 3 = 314. km/sec

The TANGENTIAL velocity at 10:11 = 0. km/sec

The TOTAL velocity at 10:11 = 314. km/sec

The TANGENTIAL velocity at 10:28 = 0. km/sec

The TOTAL velocity at 10:28 = 314. km/sec

\*\*\*\*\*

The following info is for estimating goodness of the fit

\*\*\*\*\*

Fit is ok [ier=1]

Standard Deviation in the height = 0.47

Standard Deviation in start time measurement = 0.149E+02

Error in time = 0.42502E+01 using best fit method

See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.440E-02

Reduced Chi Squared = 0.134E-01

Chi Squared = 0.268E-01

The probability for exceeding chi square = 0.996E+00

The correlation coefficient = 0.990E+00

The probability that no LINEAR correlation exists between the variables = 0.1005E-01

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

\*\*\*\*\*

This is a 2 order run

\*\*\*\*\*

\*\*\*\*\*

INPUT:

\*\*\*\*\*

year	doy	time	radii	radius	error in	angle	error in	datatype
1989	168	9:47: 6	2.90	+/- 0.10	270.0	+/- 1.0		SMM
1989	168	10: 3:38	3.20	+/- 0.10	270.0	+/- 1.0		SMM
1989	168	10:11:51	3.50	+/- 0.10	270.0	+/- 1.0		SMM
1989	168	10:28:22	4.00	+/- 0.10	270.0	+/- 1.0		SMM

\*\*\*\*\*

Structure being measured:

Top of Core

\*\*\*\*\*

\*\*\*\*\*

OUTPUT:

\*\*\*\*\*

START TIME:

tstart=DOY168 9:13 from derivative = 0

Event begins at 2.60 Solar Radii

Origin defined at DOY168 9:40

RADIAL INFORMATION:

RADIAL ACCELERATION = 0.948E-01 +/- 0.375E-01 km/sec\*\*2

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) = 0.278E+01 +/- 0.678E-01 [solar radii]  
c(2) = 0.134E-01 +/- 0.555E-02 [radii/min]  
c(2) = 0.156E+03 +/- 0.643E+02 [km/sec]  
c(3) = 0.245E-03 +/- 0.971E-04 [radii/min\*\*2]  
c(3) = 0.948E-01 +/- 0.375E-01 [km/sec\*\*2]

The computed ERRORS in coefficients [BEVINGTON] are:

Approximate error in c(1) = 0.95822E-01 [radii] Bevington pg 154 (8-30)  
Exact error in c(1) = 0.26270E-01 [radii] Bevington pg 154 (8-28)  
Approximate error in c(2) = 0.78451E-02 [radii/min] Bevington pg 154 (8-30)  
Exact error in c(2) = 0.38167E-02 [radii/min] Bevington pg 154 (8-28)  
Approximate error in c(3) = 0.13730E-03 [radii/min\*\*] Bevington pg 154 (8-30)  
Exact error in c(3) = 0.68645E-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) = 270. +/- 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 9:47 = 0. km/sec

The TOTAL velocity at 9:47 = 196. km/sec

The TANGENTIAL velocity at 10: 3 = 0. km/sec

The TOTAL velocity at 10: 3 = 290. km/sec

The TANGENTIAL velocity at 10:11 = 0. km/sec

The TOTAL velocity at 10:11 = 337. km/sec

The TANGENTIAL velocity at 10:28 = 0. km/sec

The TOTAL velocity at 10:28 = 431. km/sec

\*\*\*\*\*

The following info is for estimating goodness of the fit

\*\*\*\*\*

Fit is ok [ier=1]

Standard Deviation in the height = 0.47

Standard Deviation in start time measurement = 0.149E+02

Value of reduced Chi Squared returned from nllst2 = 0.158E-02

Reduced Chi Squared = 0.788E-02

Chi Squared = 0.788E-02

The probability for exceeding chi square = 0.968E+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 = 0.9900E+00

The correlation between the data and the time\*\*2 term = 0.9906E+00

The correlation between the data and the complete equation of motion = 0.9952E+00

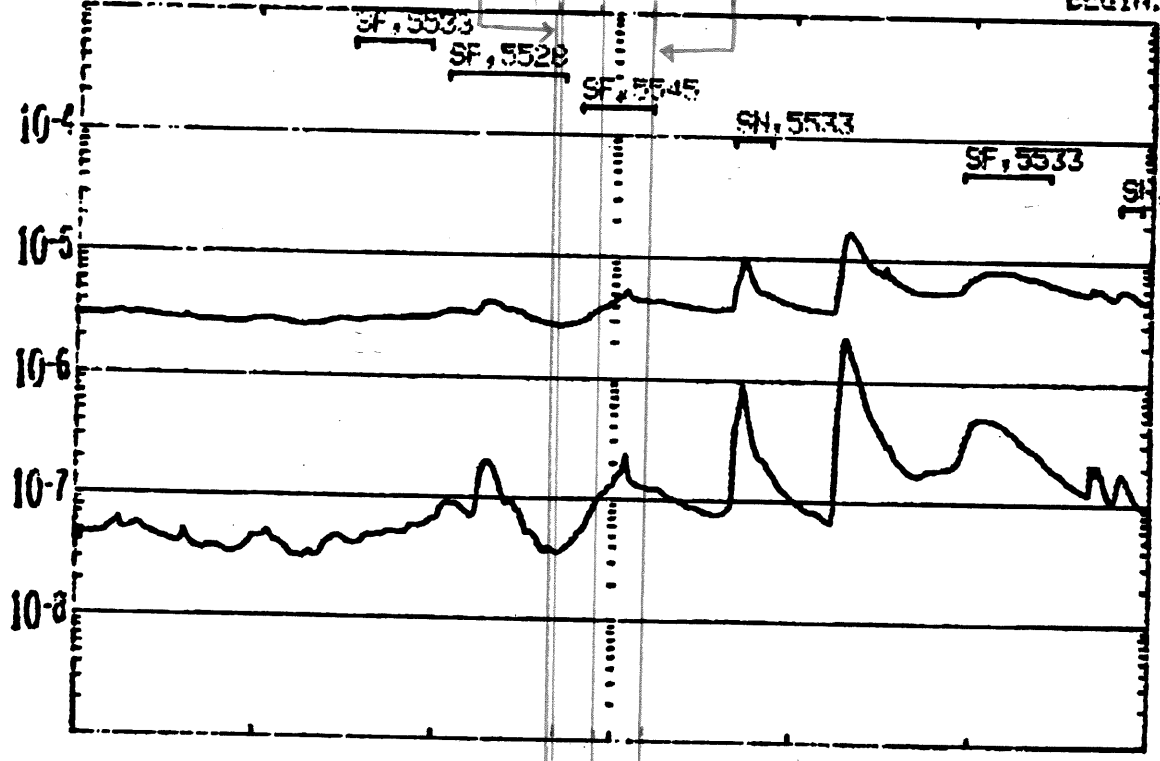
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]

1989 Day 168

Plot and OPTICAL DATA TOGETHER

BEGIN: 17 JUN 89

Watts meter<sup>2</sup>



X  
M  
C  
B  
A  
GOES 7 0.5-4.0A GOES 7 1.0-8.0A  
OPTICAL FLARES

17/0600 17/0900 17/1200

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

SAA's  
NIGHT  
RUN: 1852UT  
19 JUN 89