SMM C/P 1987 DOY309 105 +/- 0 degrees

height = h + velocity*time   # data points = 11

Top of Cavity [From Subtractions]

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
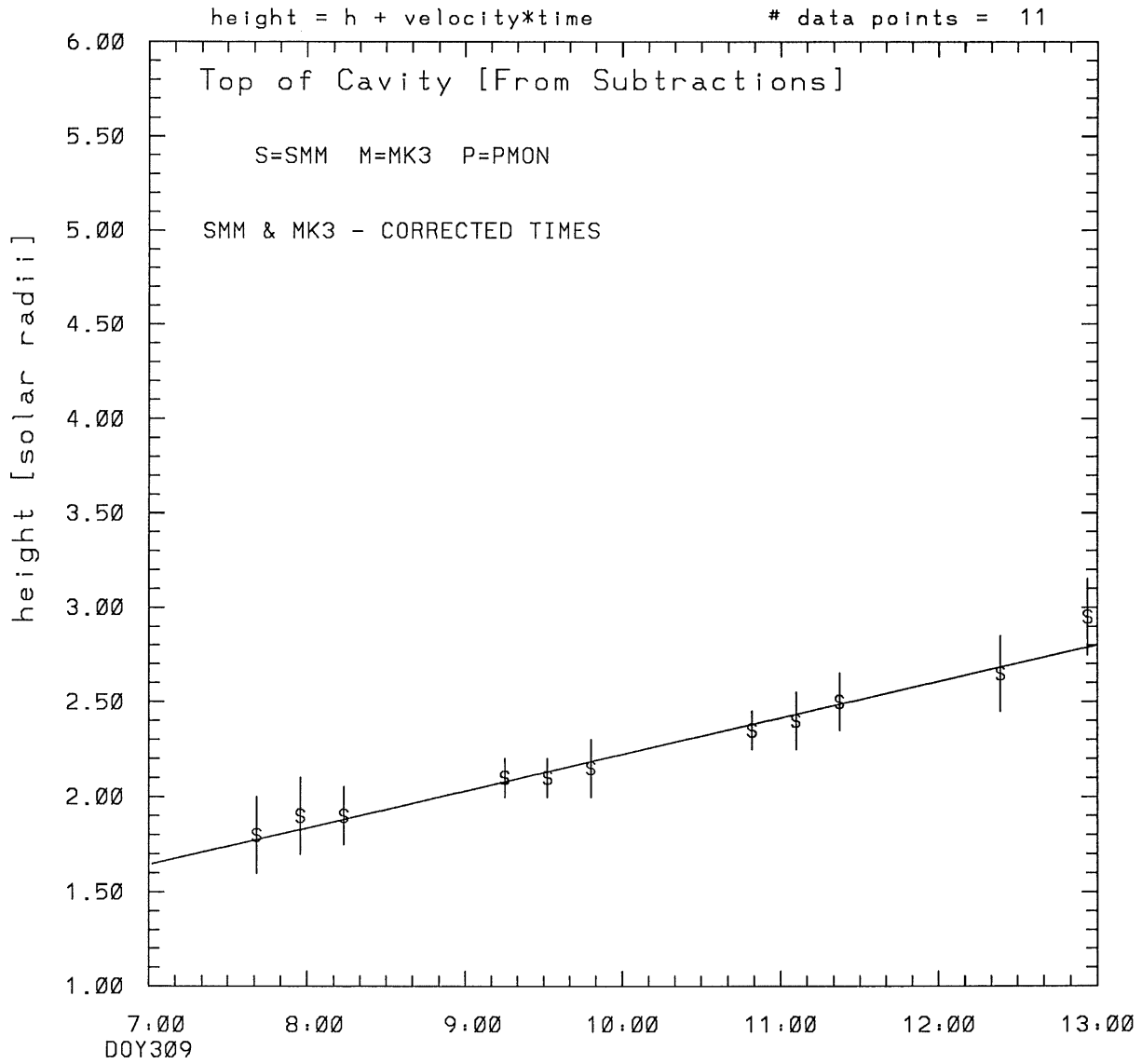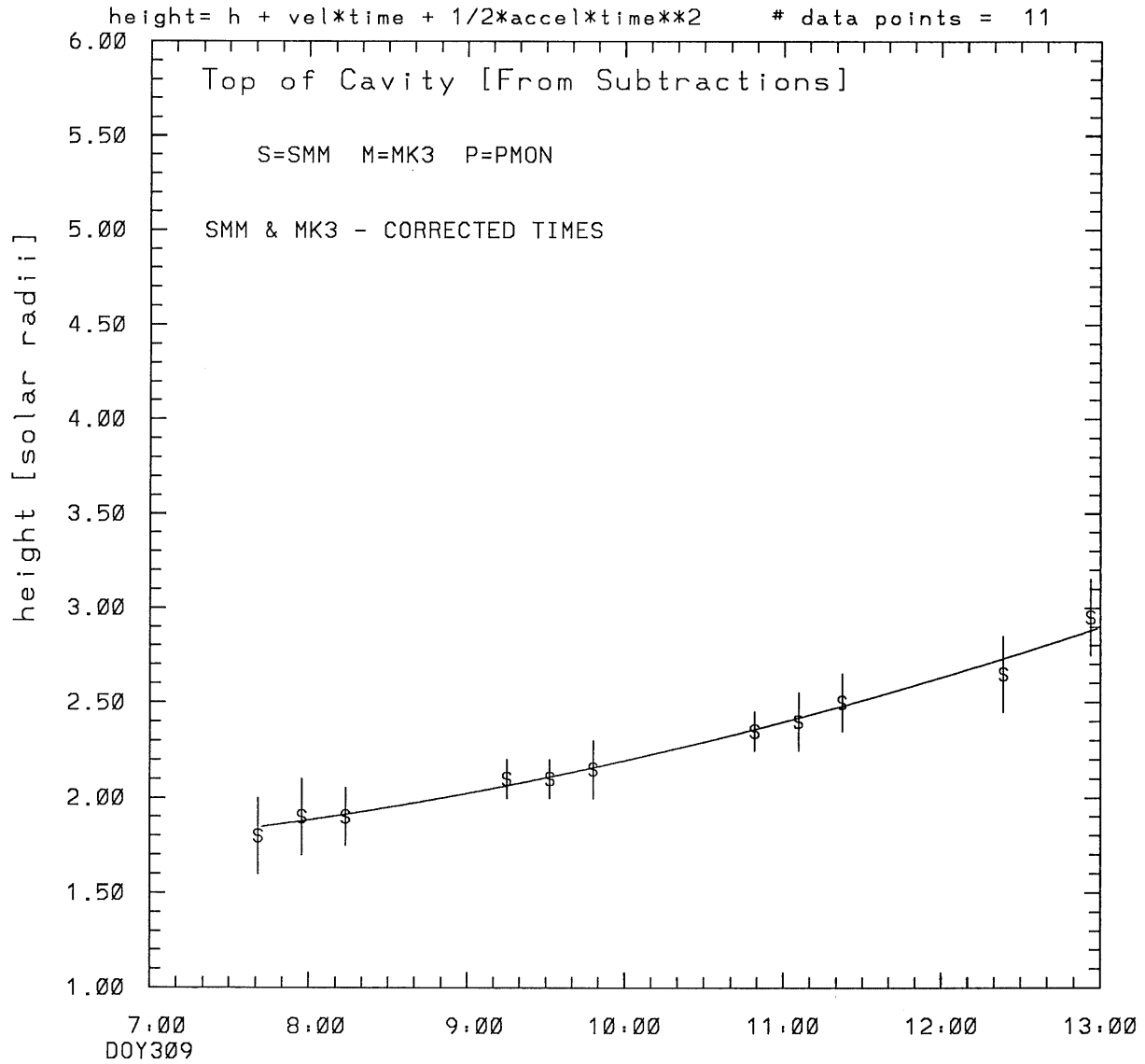2.50
2.00
1.50
1.00

7:00   8:00   9:00   10:00   11:00   12:00   13:00
DOY309

tstart=DOY309 3:40 +/-   1.9 [min.]
radial velocity=   37. +/-   2. [km/sec]

SMM C/P 1987 DOY309 105 +/- 0 degrees

height= h + vel*time + 1/2*accel*time**2   # data points = 11

Top of Cavity [From Subtractions]
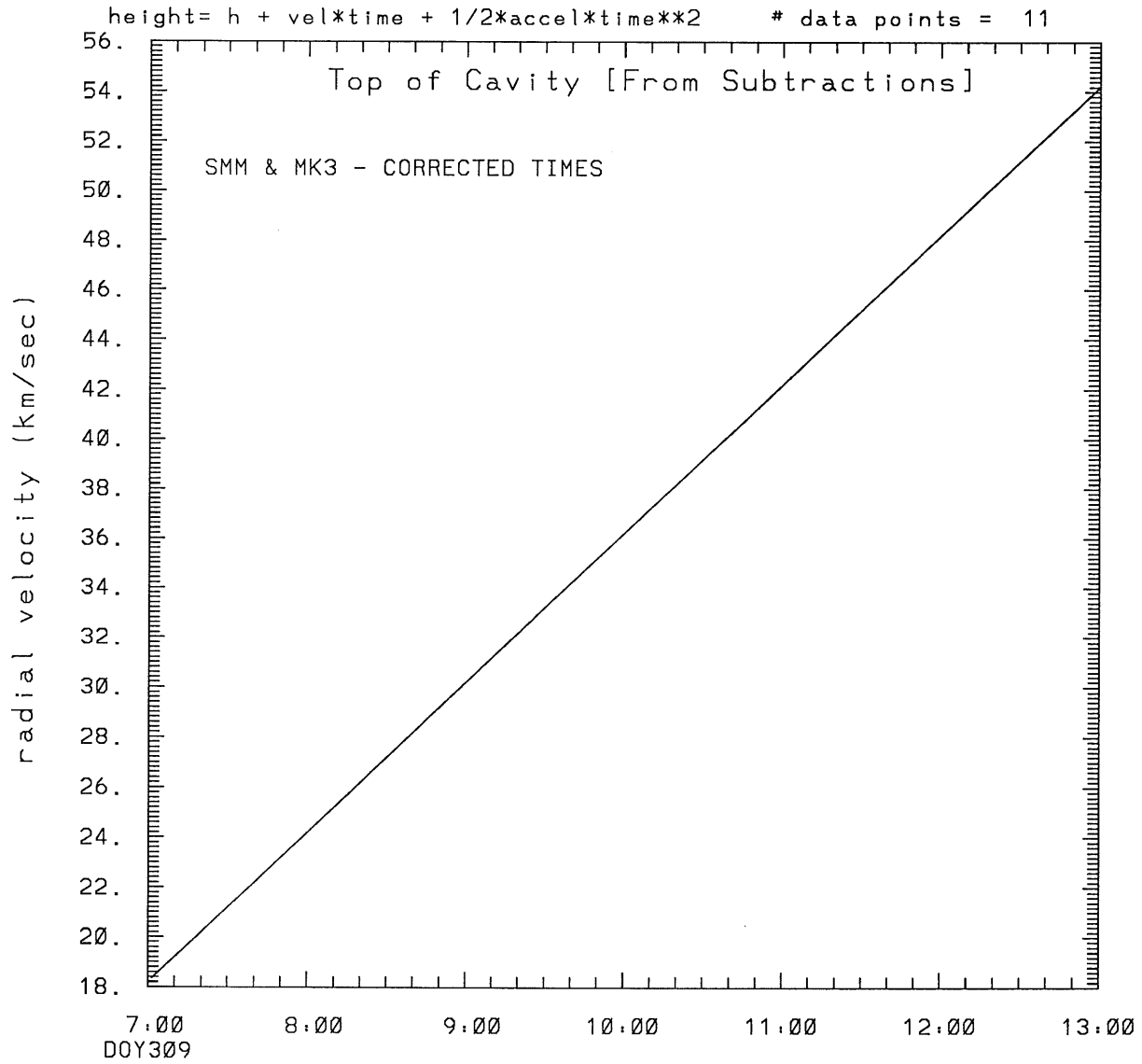
S=SMM   M=MK3 P=PMON

SMM & MK3 - CORRECTED TIMES

tstart=DOY309 3:59   from derivative=0
Event begins at   1.63 Solar Radii
radial acceleration= 0.0017 +/- 0.0005 [km/sec**2]

SMM C/P 1987 DOY309 105 +/- 0 degrees

height= h + vel*time + 1/2*accel*time**2   # data points = 11

Top of Cavity [From Subtractions]

SMM & MK3 - CORRECTED TIMES

radial velocity (km/sec)

56.
54.
52.
50.
48.
46.
44.
42.
40.
38.
36.
34.
32.
30.
28.
26.
24.
22.
20.
18.

7:00   8:00   9:00   10:00   11:00   12:00   13:00
DOY309

tstart=DOY309 3:59   from derivative=0
Event begins at   1.63 Solar Radii
radial acceleration=0.167E-02 km/sec**2

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


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

		error in			error in	
year doy	time	radii	radius	angle	angle	datatype
1987 309	7:40:53	1.80 +/-	0.20	105.0 +/-	0.5	SMM
1987 309	7:57:23	1.90 +/-	0.20	105.0 +/-	0.5	SMM
1987 309	8:13:54	1.90 +/-	0.15	105.0 +/-	0.5	SMM
1987 309	9:15: 4	2.10 +/-	0.10	105.0 +/-	0.5	SMM
1987 309	9:31:34	2.10 +/-	0.10	105.0 +/-	0.5	SMM
1987 309	9:48: 4	2.15 +/-	0.15	105.0 +/-	0.5	SMM
1987 309	10:49:15	2.35 +/-	0.10	105.0 +/-	0.5	SMM
1987 309	11: 5:45	2.40 +/-	0.15	105.0 +/-	0.5	SMM
1987 309	11:22:15	2.50 +/-	0.15	105.0 +/-	0.5	SMM
1987 309	12:23:26	2.65 +/-	0.20	105.0 +/-	0.5	SMM
1987 309	12:56:27	2.95 +/-	0.20	105.0 +/-	0.5	SMM

```
*******************************************
 Structure being measured:
Top of Cavity [From Subtractions]
*******************************************


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


START TIME:


Event began at t = 0 + -0.200E+03 +/-  0.191E+01 [minutes]
In more convenient units:
Event began at DOY 309  3:40 +/-  0.191E+01 [minutes]


Origin defined at DOY309  7: 0

RADIAL INFORMATION:


RADIAL VELOCITY =    37. +/-    2. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:


c(1) =    0.164E+01 +/-   0.354E-01 [solar radii]
c(2) =    0.321E-02 +/-   0.179E-03 [radii/min]
c(2) =    0.373E+02 +/-   0.208E+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:
```

<div align="center">error in c(1)= 0.40750E-01 [radii] see Bevington pg. 114</div>
<div align="center">error in c(2)= 0.19243E-03 [radii/min] see Bevington pg. 114</div>

ANGULAR INFORMATION:

ANGULAR VELOCITY = 0.0000E+00 +/- 0.0000E+00[radians/sec]

The computed ANGULAR coefficients and errors FROM NLLST2 are:

a(1) = 105. +/- 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 7:40 = 0.000E+00 km/sec
The TOTAL velocity at 7:40 = 37. km/sec

The TANGENTIAL velocity at 7:57 = 0.000E+00 km/sec
The TOTAL velocity at 7:57 = 37. km/sec

The TANGENTIAL velocity at 8:13 = 0.000E+00 km/sec
The TOTAL velocity at 8:13 = 37. km/sec

The TANGENTIAL velocity at 9:15 = 0.000E+00 km/sec
The TOTAL velocity at 9:15 = 37. km/sec

The TANGENTIAL velocity at 9:31 = 0.000E+00 km/sec
The TOTAL velocity at 9:31 = 37. km/sec

The TANGENTIAL velocity at 9:48 = 0.000E+00 km/sec
The TOTAL velocity at 9:48 = 37. km/sec

The TANGENTIAL velocity at 10:49 = 0.000E+00 km/sec
The TOTAL velocity at 10:49 = 37. km/sec

The TANGENTIAL velocity at 11: 5 = 0.000E+00 km/sec
The TOTAL velocity at 11: 5 = 37. km/sec

The TANGENTIAL velocity at 11:22 = 0.000E+00 km/sec
The TOTAL velocity at 11:22 = 37. km/sec

The TANGENTIAL velocity at 12:23 = 0.000E+00 km/sec
The TOTAL velocity at 12:23 = 37. km/sec

The TANGENTIAL velocity at 12:56 = 0.000E+00 km/sec
The TOTAL velocity at 12:56 = 37. km/sec

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

Fit is ok [ier=1]

Standard Deviation in the height = 0.35
Standard Deviation in start time measurement =   0.102E+03
Error in time =   0.60500E+02 using best fit method
See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.225E-02
Reduced Chi Squared = 0.375E-01
Chi Squared = 0.337E+00
The probability for exceeding chi square = 0.100E+01

The correlation coefficient =   0.986E+00
The probability that no LINEAR correlation exists between the variables =   0.2898E-07
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
1987 309   7:40:53  1.80 +/- 0.20   105.0 +/-  0.5      SMM
1987 309   7:57:23  1.90 +/- 0.20   105.0 +/-  0.5      SMM
1987 309   8:13:54  1.90 +/- 0.15   105.0 +/-  0.5      SMM
1987 309   9:15: 4  2.10 +/- 0.10   105.0 +/-  0.5      SMM
1987 309   9:31:34  2.10 +/- 0.10   105.0 +/-  0.5      SMM
1987 309   9:48: 4  2.15 +/- 0.15   105.0 +/-  0.5      SMM
1987 309  10:49:15  2.35 +/- 0.10   105.0 +/-  0.5      SMM
1987 309  11: 5:45  2.40 +/- 0.15   105.0 +/-  0.5      SMM
1987 309  11:22:15  2.50 +/- 0.15   105.0 +/-  0.5      SMM
1987 309  12:23:26  2.65 +/- 0.20   105.0 +/-  0.5      SMM
1987 309  12:56:27  2.95 +/- 0.20   105.0 +/-  0.5      SMM


*******************************************
 Structure being measured:
Top of Cavity [From Subtractions]
*******************************************


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


START TIME:

 tstart=DOY309  3:59 from derivative = 0
Event begins at   1.63 Solar Radii
 Origin defined at DOY309  7: 0

RADIAL INFORMATION:

RADIAL ACCELERATION =  0.167E-02 +/-  0.514E-03 km/sec**2

The computed RADIAL coefficients and errors FROM NLLST2 are:

c(1) =   0.177E+01 +/-   0.472E-01 [solar radii]
c(2) =   0.157E-02 +/-   0.523E-03 [radii/min]
c(2) =   0.182E+02 +/-   0.607E+01 [km/sec]
c(3) =   0.431E-05 +/-   0.133E-05 [radii/min**2]
c(3) =   0.167E-02 +/-   0.514E-03 [km/sec**2]

The computed ERRORS in coefficients [BEVINGTON] are:

      Approximate error in c(1) =  0.48808E-01 [radii] Bevington pg 154 (8-30)
          Exact error in c(1) =  0.92727E-02 [radii] Bevington pg 154 (8-28)
```

Approximate error in c(2) = 0.58549E-03 [radii/min] Bevington pg 154 (8-30)
Exact error in c(2) = 0.11591E-03 [radii/min] Bevington pg 154 (8-28)
Approximate error in c(3) = 0.14779E-05 [radii/min**] Bevington pg 154 (8-30)
Exact error in c(3) = 0.34441E-06 [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) = 105. +/- 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 7:40 = 0.000E+00 km/sec
The TOTAL velocity at 7:40 = 22. km/sec

The TANGENTIAL velocity at 7:57 = 0.000E+00 km/sec
The TOTAL velocity at 7:57 = 24. km/sec

The TANGENTIAL velocity at 8:13 = 0.000E+00 km/sec
The TOTAL velocity at 8:13 = 26. km/sec

The TANGENTIAL velocity at 9:15 = 0.000E+00 km/sec
The TOTAL velocity at 9:15 = 32. km/sec

The TANGENTIAL velocity at 9:31 = 0.000E+00 km/sec
The TOTAL velocity at 9:31 = 33. km/sec

The TANGENTIAL velocity at 9:48 = 0.000E+00 km/sec
The TOTAL velocity at 9:48 = 35. km/sec

The TANGENTIAL velocity at 10:49 = 0.000E+00 km/sec
The TOTAL velocity at 10:49 = 41. km/sec

The TANGENTIAL velocity at 11: 5 = 0.000E+00 km/sec
The TOTAL velocity at 11: 5 = 43. km/sec

The TANGENTIAL velocity at 11:22 = 0.000E+00 km/sec
The TOTAL velocity at 11:22 = 44. km/sec

The TANGENTIAL velocity at 12:23 = 0.000E+00 km/sec
The TOTAL velocity at 12:23 = 51. km/sec

The TANGENTIAL velocity at 12:56 = 0.000E+00 km/sec
The TOTAL velocity at 12:56 = 54. km/sec

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

Fit is ok [ier=1]

Standard Deviation in the height = 0.35
Standard Deviation in start time measurement =   0.102E+03
Value of reduced Chi Squared returned from nllst2 = 0.115E-02
Reduced Chi Squared = 0.171E-01
Chi Squared = 0.137E+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 =   0.7743E+00
The correlation between the data and the time**2 term =   0.7814E+00
The correlation between the data and the complete equation of motion =   0.9877E+00
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]