SMM C/P 1989 DOY316 247 +/- Ø degrees

height = h + velocity*time   # data points =   4

Top of Loop

   S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

height [solar radii]

(y-axis: 1.00 to 6.00)

(x-axis: 7:00 to 9:00, DOY316)
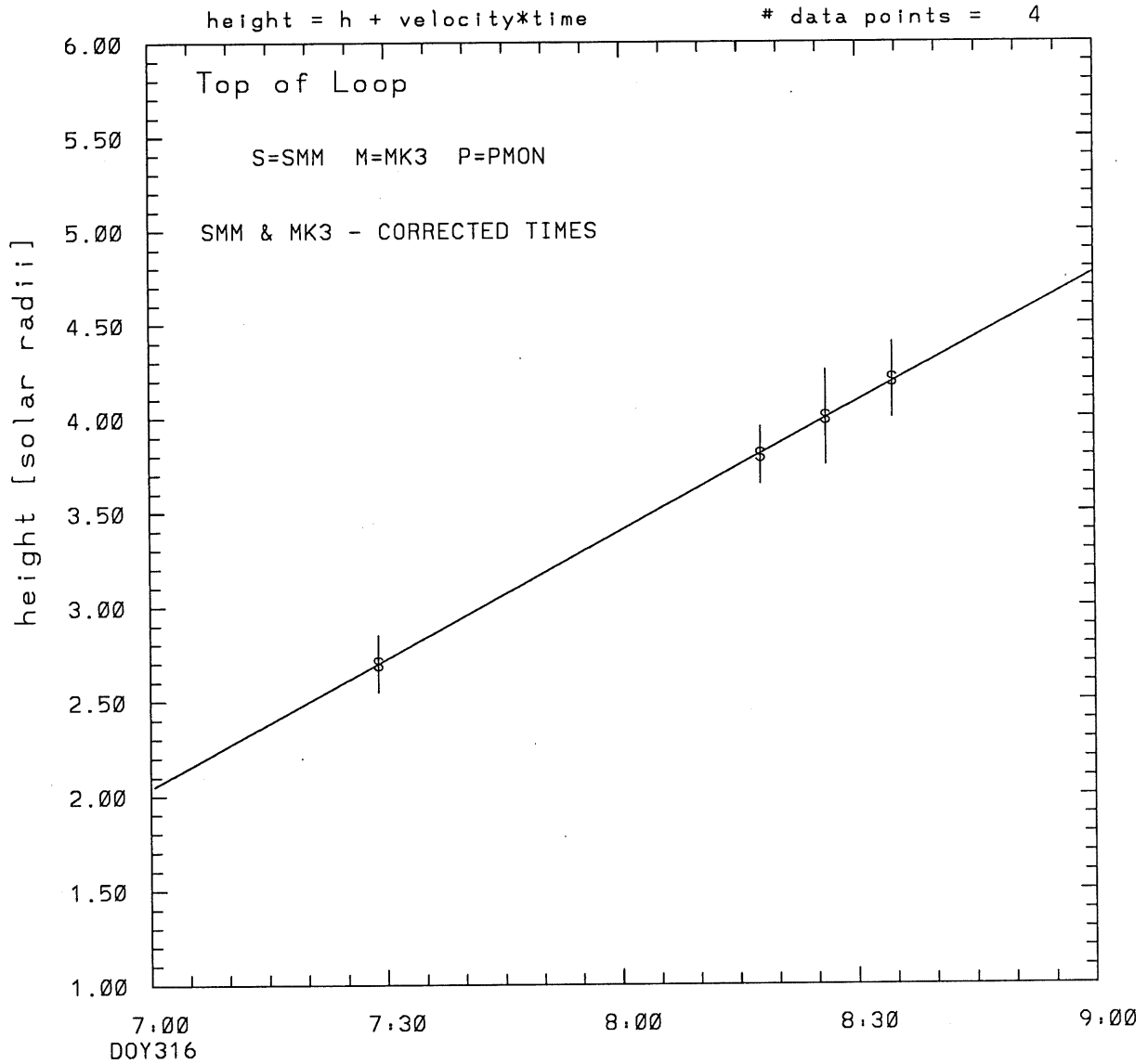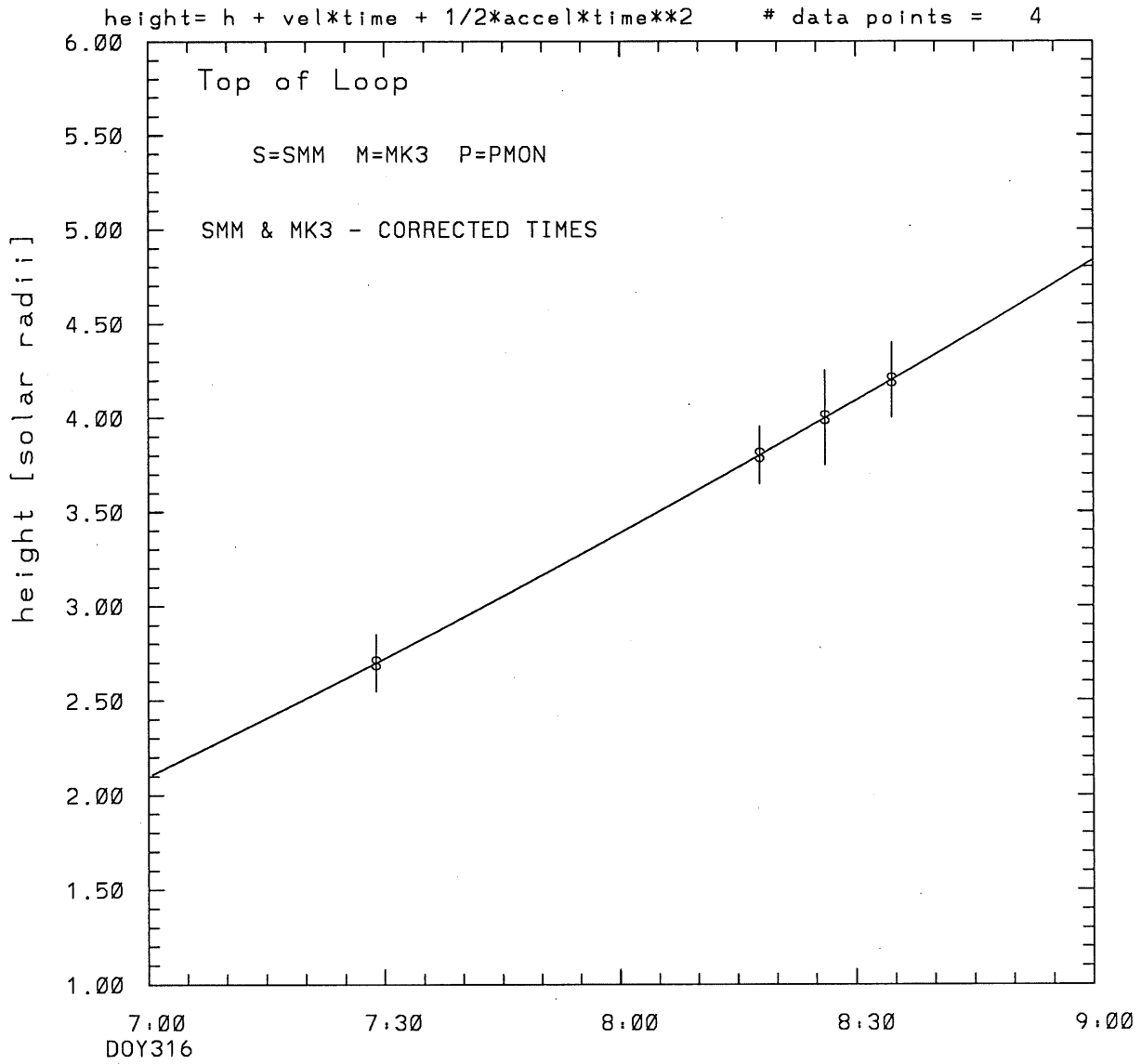
tstart=DOY316 6:16 +/-   Ø.1 [min.]
radial velocity= 264. +/-   2. [km/sec]

SMM C/P 1989 DOY316 247 +/- Ø degrees

height= h + vel*time + 1/2*accel*time**2   # data points =   4

Top of Loop

S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES

tstart=DOY316 6: 2 +/-   2.7 [min.]

radial acceleration= Ø.ØØ86 +/- Ø.ØØ09 [km/sec**2]

SMM C/P 1989 DOY316 247 +/- Ø degrees
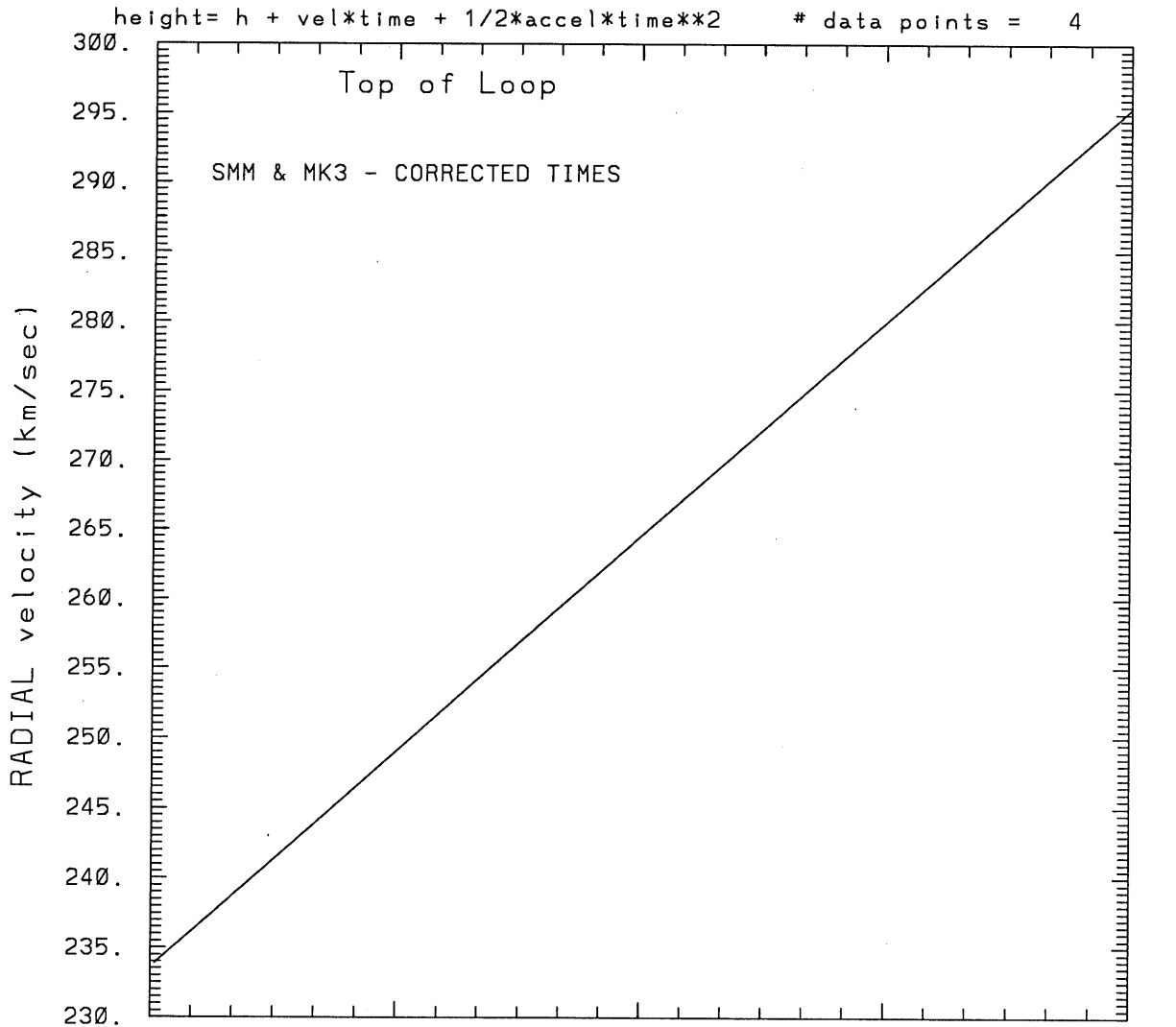
height= h + vel*time + 1/2*accel*time**2   # data points =   4

Top of Loop

SMM & MK3 - CORRECTED TIMES

RADIAL velocity (km/sec)

300.
295.
290.
285.
280.
275.
270.
265.
260.
255.
250.
245.
240.
235.
230.
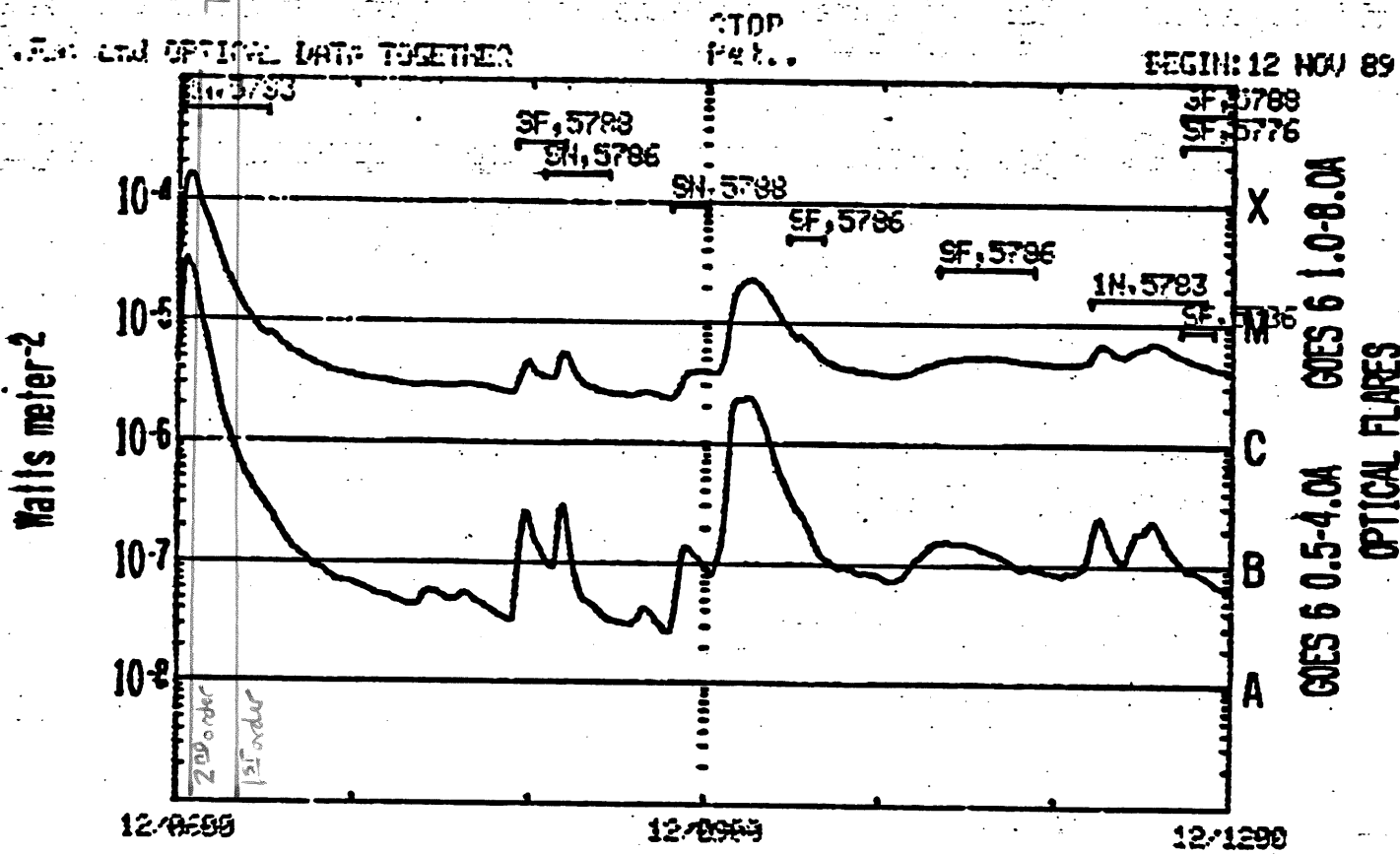
7:00   7:30   8:00   8:30   9:00
DOY316

tstart=DOY316   6: 2 +/-   2.7 [min.]

radial acceleration=Ø.858E-Ø2 km/sec**2

1989 Doy 316

Top of Front Center – 259°
[6:19] First Order
[6:05] 2nd order

PLOT X-RAY OPTICAL DATA TOGETHER

STOP
Plot...

BEGIN: 12 NOV 89

Walts meter⁻²

10^{-4} X

10^{-5} M

10^{-6} C

10^{-7} B

10^{-8} A

SF,5788
SN,5786
SN,5788
SF,5786
SF,5786
1N,5783
SF,5786
SF,5788
SF,5776
1N,5783
SF,5783

2nd order
1st order

GOES 6 1.0-8.0A
GOES 6 0.5-4.0A
OPTICAL FLARES

12/0800   12/0000   12/1200

SAA's
NIGHT

GOES-6 1 MIN DATA: OPTICAL FLARE DUR. IMP. REGION

RUN: 1953UT
16 NOV 89

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

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

                                   error in       error in
     year doy     time     radii   radius      angle   angle   datatype
     1989 316   7:28:56   2.70 +/- 0.15      247.0 +/-  0.5      SMM
     1989 316   8:17:50   3.80 +/- 0.15      247.0 +/-  1.0      SMM
     1989 316   8:26: 6   4.00 +/- 0.25      247.0 +/-  1.0      SMM
     1989 316   8:34:32   4.20 +/- 0.20      247.0 +/-  1.0      SMM

    ******************************************
     Structure being measured:
    Top of Loop
    ******************************************

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

    START TIME:

     Event began at t = 0 + -0.457E+02 +/-  0.102E+00 [minutes]
     In more convenient units:
     Event began at DOY 316  6:16 +/-  0.102E+00 [minutes]

     Origin defined at DOY316  7: 0

    RADIAL INFORMATION:

    RADIAL VELOCITY =   264. +/-     2. km/sec

    The computed RADIAL coefficients and errors FROM NLLST2 are:

     c(1) =    0.204E+01 +/-    0.113E-01 [solar radii]
     c(2) =    0.227E-01 +/-    0.160E-03 [radii/min]
     c(2) =    0.264E+03 +/-    0.186E+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)=  0.15718E-01 [radii] see Bevington pg. 114
                     error in c(2)=  0.20619E-03 [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) = 247. +/-    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 RADIAL velocity at  7:28 =   264. km/sec

    The RADIAL velocity at  8:17 =   264. km/sec

    The RADIAL velocity at  8:26 =   264. km/sec
```

The RADIAL velocity at 8:34 = 264. 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 =   0.255E+02
 Error in time =   0.65343E+00 using best fit method
 See Taylor Error Analysis [Univ of Colorado] pg.78

 Value of reduced Chi Squared returned from nllst2 = 0.746E-04
 Reduced Chi Squared = 0.342E-03
 Chi Squared = 0.684E-03
 The probability for exceeding chi square = 0.100E+01

 The correlation coefficient =   0.100E+01
 The probability that no LINEAR correlation exists between the variables =   0.7308]
 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
1989 316   7:28:56    2.70 +/- 0.15     247.0 +/-  0.5       SMM
1989 316   8:17:50    3.80 +/- 0.15     247.0 +/-  1.0       SMM
1989 316   8:26: 6    4.00 +/- 0.25     247.0 +/-  1.0       SMM
1989 316   8:34:32    4.20 +/- 0.20     247.0 +/-  1.0       SMM


*******************************************
 Structure being measured:
Top of Loop
*******************************************


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


START TIME:

 Event began at t = 0 + -0.583E+02 +/-  0.273E+01 [minutes]
 In more convenient units:
 Event began at DOY 316  6: 2 +/-  0.273E+01 [minutes]

 Origin defined at DOY316  7: 0

RADIAL INFORMATION:

RADIAL ACCELERATION =  0.858E-02 +/-  0.914E-03 km/sec**2

The computed RADIAL coefficients and errors FROM NLLST2 are:

 c(1) =      0.210E+01 +/-      0.659E-02 [solar radii]
 c(2) =      0.201E-01 +/-      0.278E-03 [radii/min]
 c(2) =      0.234E+03 +/-      0.323E+01 [km/sec]
 c(3) =      0.222E-04 +/-      0.236E-05 [radii/min**2]
 c(3) =      0.858E-02 +/-      0.914E-03 [km/sec**2]

 The computed ERRORS in coefficients [BEVINGTON] are:

    Approximate error in c(1) =  0.13438E-01 [radii] Bevington pg 154 (8-30)
          Exact error in c(1) =  0.25915E-02 [radii] Bevington pg 154 (8-28)
    Approximate error in c(2) =  0.55375E-03 [radii/min] Bevington pg 154 (8-30)
          Exact error in c(2) =  0.11929E-03 [radii/min] Bevington pg 154 (8-28)
    Approximate error in c(3) =  0.46292E-05 [radii/min**2] Bevington pg 154 (8-30)
          Exact error in c(3) =  0.10313E-05 [radii/min**2] 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) = 247. +/-    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 RADIAL velocity at  7:28 =  249. km/sec
```

The RADIAL velocity at 8:17 = 274. km/sec

The RADIAL velocity at 8:26 = 278. km/sec

The RADIAL velocity at 8:34 = 282. 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 =   0.255E+02
Value of reduced Chi Squared returned from nllst2 = 0.249E-05
Reduced Chi Squared = 0.275E-04
Chi Squared = 0.275E-04
The probability for exceeding chi square = 0.999E+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 =   0.1087E+01
The correlation between the data and the time**2 term =   0.1068E+01
The correlation between the data and the complete equation of motion=0.9999E+00
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]