# SMM C/P   1986 DOY193   275 +/-   0 degrees

height = h + velocity*time          # data points =   5



Top of (Loop?) Front

S=SMM   M=MK3   P=PMON

SMM & MK3 - CORRECTED TIMES
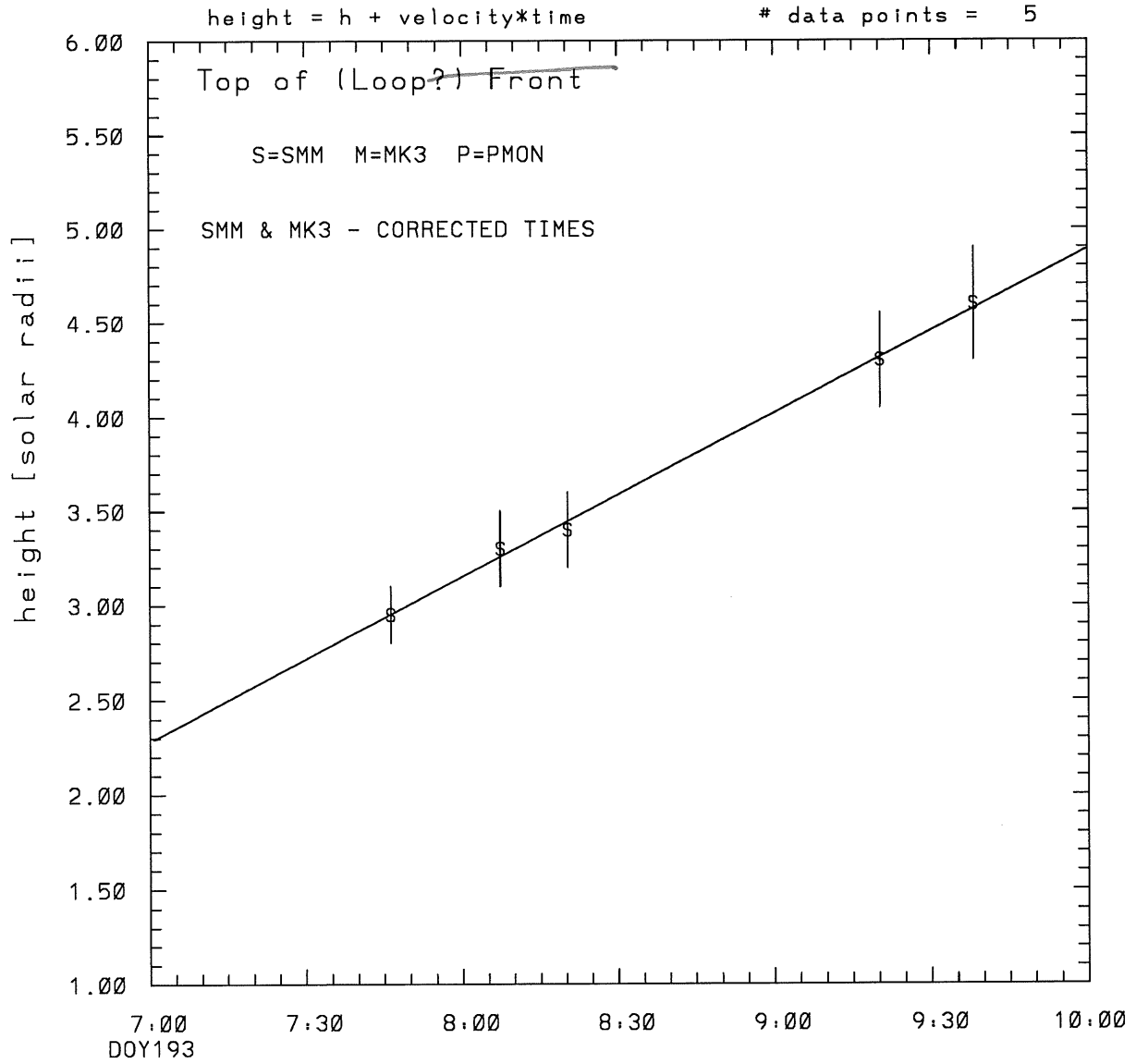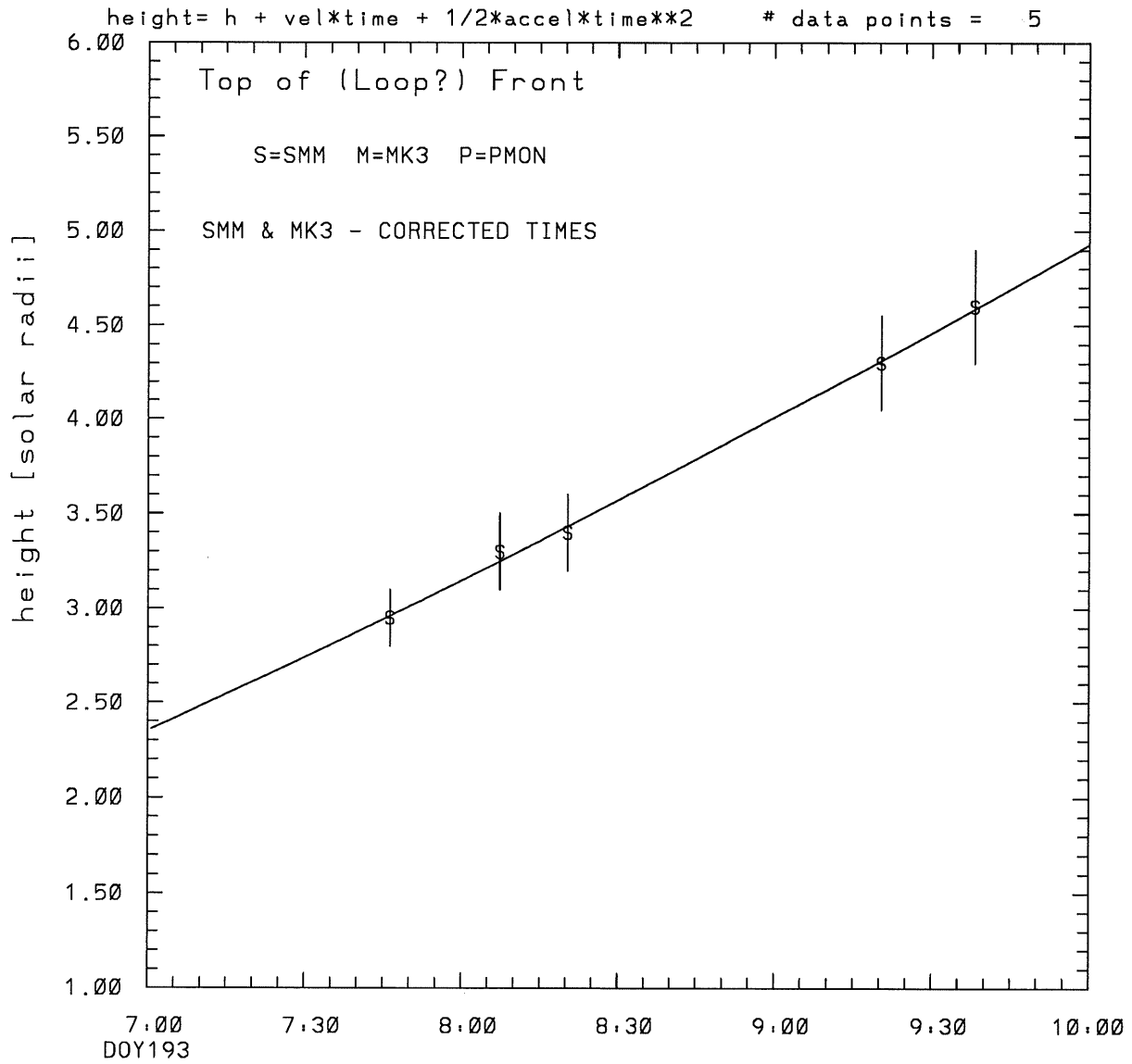
tstart=DOY193   5:32 +/-      0.5 [min.]
radial velocity=   168. +/-   5. [km/sec]

SMM C/P  1986 DOY193  275 +/-  0 degrees

height= h + vel*time + 1/2*accel*time**2     # data points =   5

Top of (Loop?) Front

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   7:30   8:00   8:30   9:00   9:30   10:00
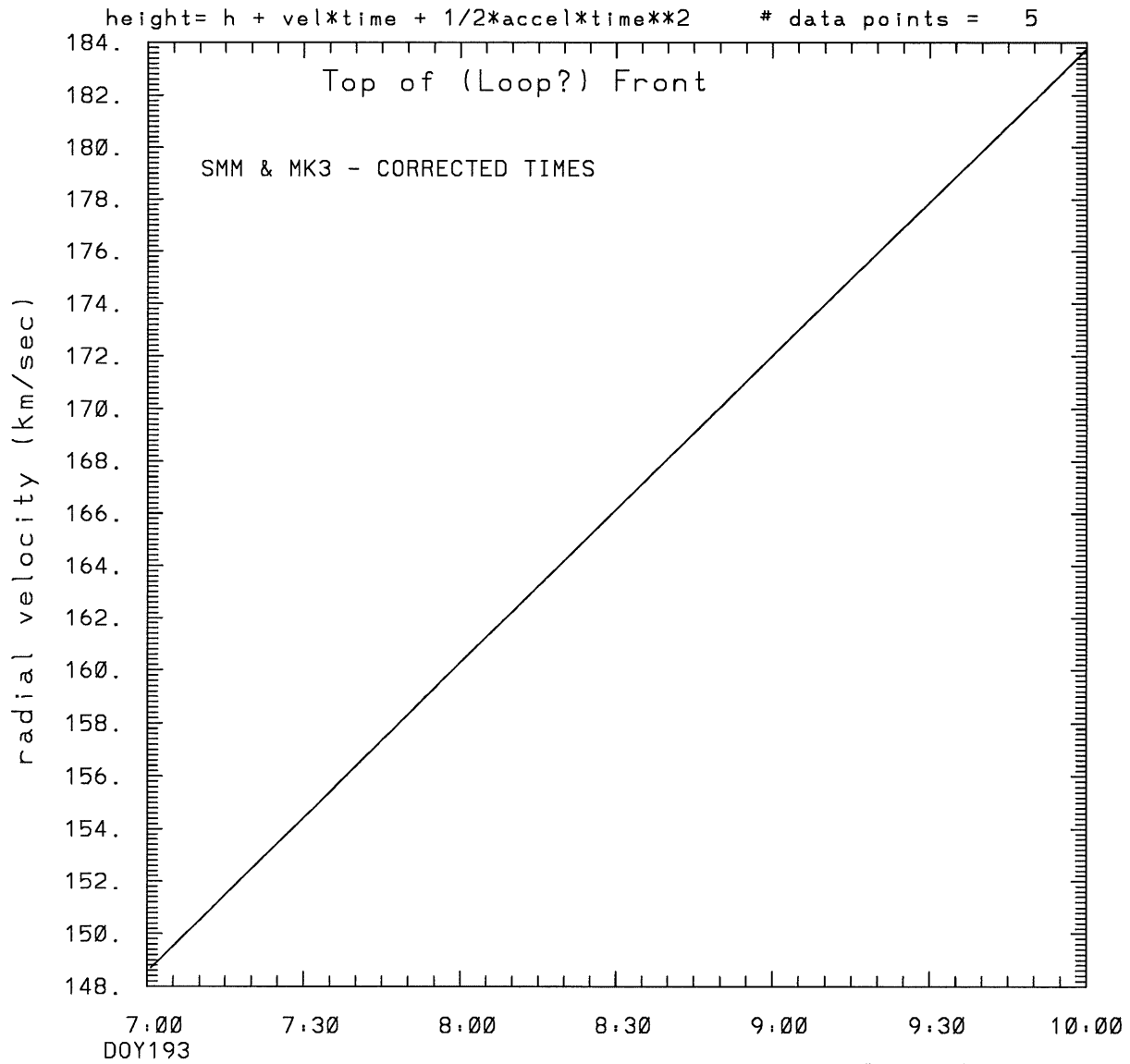DOY193

tstart=DOY193  5: 8 +/-     78.5 [min.]

radial acceleration=  0.0033 +/-  0.0059 [km/sec**2]

SMM C/P   1986 DOY193   275 +/-   Ø degrees

height= h + vel*time + 1/2*accel*time**2      # data points =    5

Top of (Loop?) Front

SMM & MK3 - CORRECTED TIMES

radial velocity (km/sec)

184.
182.
180.
178.
176.
174.
172.
170.
168.
166.
164.
162.
160.
158.
156.
154.
152.
150.
148.

7:00      7:30      8:00      8:30      9:00      9:30      10:00
DOY193

tstart=DOY193   5: 8 +/-      78.5 [min.]

radial acceleration=Ø.326E-Ø2  km/sec**2

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


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

|          |       |       | error in |       | error in |          |
|----------|-------|-------|----------|-------|----------|----------|
| year doy | time  | radii | radius   | angle | angle    | datatype |
| 1986 193 | 7:46:17 | 2.95 +/- | 0.15 | 275.0 +/- | 1.0 | SMM |
| 1986 193 | 8: 7:17 | 3.30 +/- | 0.20 | 275.0 +/- | 0.5 | SMM |
| 1986 193 | 8:20:17 | 3.40 +/- | 0.20 | 275.0 +/- | 0.5 | SMM |
| 1986 193 | 9:20:18 | 4.30 +/- | 0.25 | 275.0 +/- | 0.5 | SMM |
| 1986 193 | 9:38: 8 | 4.60 +/- | 0.30 | 275.0 +/- | 0.5 | SMM |

```
*****************************************
 Structure being measured:
Top of (Loop?) Front
*****************************************


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


START TIME:
```

Event began at t = 0 + -0.885E+02 +/- 0.467E+00 [minutes]
In more convenient units:
Event began at DOY 193 5:32 +/- 0.467E+00 [minutes]

Origin defined at DOY193 7: 0

RADIAL INFORMATION:

RADIAL VELOCITY = 168. +/- 5. km/sec

The computed RADIAL coefficients and errors FROM NLLST2 are:

$c(1) =$ 0.228E+01 +/- 0.346E-01 [solar radii]
$c(2) =$ 0.145E-01 +/- 0.389E-03 [radii/min]
$c(2) =$ 0.168E+03 +/- 0.451E+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 $c(1)=$ 0.44869E-01 [radii] see Bevington pg. 114
error in $c(2)=$ 0.41730E-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) = 275. +/-  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  7:46 =  0.000E+00 km/sec
The TOTAL velocity at  7:46 =  168. km/sec

The TANGENTIAL velocity at  8: 7 =  0.000E+00 km/sec
The TOTAL velocity at  8: 7 =  168. km/sec

The TANGENTIAL velocity at  8:20 =  0.000E+00 km/sec
The TOTAL velocity at  8:20 =  168. km/sec

The TANGENTIAL velocity at  9:20 =  0.000E+00 km/sec
The TOTAL velocity at  9:20 =  168. km/sec

The TANGENTIAL velocity at  9:38 =  0.000E+00 km/sec
The TOTAL velocity at  9:38 =  168. km/sec


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


Fit is ok [ier=1]

Standard Deviation in the height =  0.70
Standard Deviation in start time measurement =   0.432E+02
Error in time =       0.48222E+01 using best fit method
See Taylor Error Analysis [Univ of Colorado] pg.78

Value of reduced Chi Squared returned from nllst2 = 0.112E-02
Reduced Chi Squared = 0.482E-02
Chi Squared = 0.145E-01
The probability for exceeding chi square = 0.100E+01

The correlation coefficient =   0.999E+00
The probability that no LINEAR correlation exists between the variables =   0.5071E-04
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
1986 193  7:46:17  2.95 +/- 0.15   275.0 +/-  1.0     SMM
1986 193  8: 7:17  3.30 +/- 0.20   275.0 +/-  0.5     SMM
1986 193  8:20:17  3.40 +/- 0.20   275.0 +/-  0.5     SMM
1986 193  9:20:18  4.30 +/- 0.25   275.0 +/-  0.5     SMM
1986 193  9:38: 8  4.60 +/- 0.30   275.0 +/-  0.5     SMM


*****************************************
 Structure being measured:
Top of (Loop?) Front
*****************************************


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


START TIME:

Event began at t = 0 + -0.114E+03 +/-  0.785E+02 [minutes]
In more convenient units:
Event began at DOY 193  5: 8 +/-  0.785E+02 [minutes]


Origin defined at DOY193  7: 0


RADIAL INFORMATION:


RADIAL ACCELERATION =  0.326E-02 +/-  0.589E-02 km/sec**2


The computed RADIAL coefficients and errors FROM NLLST2 are:


c(1) =   0.235E+01 +/-   0.128E+00 [solar radii]
c(2) =   0.128E-01 +/-   0.306E-02 [radii/min]
c(2) =   0.149E+03 +/-   0.355E+02 [km/sec]
c(3) =   0.843E-05 +/-   0.152E-04 [radii/min**2]
c(3) =   0.326E-02 +/-   0.589E-02 [km/sec**2]


The computed ERRORS in coefficients [BEVINGTON] are:

     Approximate error in c(1) =  0.17871E+00 [radii] Bevington pg 154 (8-30)
         Exact error in c(1) =  0.43144E-01 [radii] Bevington pg 154 (8-28)
     Approximate error in c(2) =  0.40173E-02 [radii/min] Bevington pg 154 (8-30)
         Exact error in c(2) =  0.11400E-02 [radii/min] Bevington pg 154 (8-28)
     Approximate error in c(3) =  0.19144E-04 [radii/min**]  Bevington pg 154 (8-30)
         Exact error in c(3) =  0.57604E-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) = 275. +/-   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  7:46 =  0.000E+00 km/sec
The TOTAL velocity at  7:46 =  158. km/sec

The TANGENTIAL velocity at  8: 7 =  0.000E+00 km/sec
The TOTAL velocity at  8: 7 =  162. km/sec

The TANGENTIAL velocity at  8:20 =  0.000E+00 km/sec
The TOTAL velocity at  8:20 =  164. km/sec

The TANGENTIAL velocity at  9:20 =  0.000E+00 km/sec
The TOTAL velocity at  9:20 =  176. km/sec

The TANGENTIAL velocity at  9:38 =  0.000E+00 km/sec
The TOTAL velocity at  9:38 =  179. km/sec


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


Fit is ok [ier=1]

Standard Deviation in the height =  0.70
Standard Deviation in start time measurement =    0.432E+02
Value of reduced Chi Squared returned from nllst2 = 0.136E-02
Reduced Chi Squared = 0.499E-02
Chi Squared = 0.997E-02
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  =   0.9858E+00
The correlation between the data and the time**2 term =   0.9366E+00
The correlation between the data and the complete equation of motion =   0.9962E+00
SEE BEVINGTON "Data Reduction and Error Analysis" [1969]