



attmove

April 16, 2023

Abstract

Create Attitude History File simulating tracking of a moving target

1 Instruments/Modes

This task operates on the Attitude History File so all Instrument/Modes are applicable.

2 Use

| | |
|----------------------|-----|
| pipeline processing | no |
| interactive analysis | yes |

3 Description

attmove is a utility task for use in the aid of analysis of moving targets (planets, comets etc). It is based on an algorithm devised by Pedro Rodriguez (prodrigu@xmm.vilspa.esa.es).

In contrast to **movecalc**, **attmove** creates a new Attitude History derived from an existing AHF, using a second input table which defines the track of the object as a function of time.

attmove uses selects an arbitrary reference pointing (currently calculated from the object track) and recalculates the attitude of the spacecraft (the VIEWRA and VIEWDECL entries in the AHF) according to the following formula:

$$V^t = V_{ref} + (V_{ahf}^t - V_{obj}^t)$$

Where V^t is the output attitude, V_{ref} is the reference attitude, V_{ahf}^t is the spacecraft attitude in the source AHF at time t and V_{obj}^t is the coordinates of the target object at time t , corrected for Geocentric parallax.



4 Parameters

This section documents the parameters recognized by this task (if any).

| Parameter | Mand | Type | Default | Constraints |
|-----------|------|------|---------|-------------|
|-----------|------|------|---------|-------------|

| | | | | |
|--------------|-----|-------|------|--|
| input | yes | table | none | |
|--------------|-----|-------|------|--|

Name of input Attitude History File

| | | | | |
|---------------|-----|-------|------|--|
| output | yes | table | none | |
|---------------|-----|-------|------|--|

Name of output Attitude History File

| | | | | |
|--------------|-----|-------|------|--|
| track | yes | table | none | |
|--------------|-----|-------|------|--|

Name of input Ephemeris File

| | | | | |
|------------------|----|------|------|--|
| minstable | no | real | 30.0 | |
|------------------|----|------|------|--|

Minimum duration of stable pointing to decimate

| | | | | |
|--------------------|----|------|------|--|
| granularity | no | real | 30.0 | |
|--------------------|----|------|------|--|

Duration of decimated stable pointing bins

| | | | | |
|-------------------|----|---------|----|------|
| withrefatt | no | boolean | no | none |
|-------------------|----|---------|----|------|

User-defined reference attitude

| | | | | |
|--------------|----|------|------|--|
| refra | no | real | -999 | |
|--------------|----|------|------|--|

Right ascension of the user-defined reference attitude [decimal degrees]

| | | | | |
|---------------|----|------|------|--|
| refdec | no | real | -999 | |
|---------------|----|------|------|--|

Declination of the user-defined reference attitude [decimal degrees]

| | | | | |
|--------------------------|----|---------|----|--|
| creatediagnostics | no | boolean | no | |
|--------------------------|----|---------|----|--|

Create diagnostics file?

| | | | | |
|-----------------|----|-------|----------------|--|
| diagfile | no | table | attmovediag.ds | |
|-----------------|----|-------|----------------|--|

Diagnostics file to create



5 Errors

This section documents warnings and errors generated by this task (if any). Note that warnings and errors can also be generated in the SAS infrastructure libraries, in which case they would not be documented here. Refer to the index of all errors and warnings available in the HTML version of the SAS documentation.

invalidArgs (*error*)

granularity must be smaller than stable periods

6 Input Files

1. Input AHF file
2. Data set defining the position of the moving object as a function of time with the following minimal column structure:

| column name | meaning | type | units |
|-------------|-------------------------------------|--------|-------|
| MJD | modified Julian Day number | real64 | d |
| RA | apparent geocentric Right Ascension | real32 | deg |
| DEC | apparent geocentric Declination | real32 | deg |
| DELTA | distance to center of earth | real32 | AU |

7 Output Files

1. Output AHF file

8 Algorithm

9 Comments

References