

User manual to get_apriori_eop

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Abstract:

Program get_apriori_eop is for creation a priori Earth orientation files which can be used as input for Calc and Solve

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1 Overview

Program GET_APRIORI_EOP retrieves the file with apriori, either file finals.all from the United States Naval Observatory (USNO) or IERS C04 from the International Earth Rotation Service using program wget for automatic files retrieval via ftp. Optionally, it downloads the second external EOP file which overwrites the values defined in the first external EOP file. Optionally, it finds the differences between the retrieved EOP series and the EOP series in erp format used by Solve as the Earth orientation mod-file, finds parameters of linear regression of the differences in UT1, X pole coordinates, Y pole coordinates, then (optionally) subtracts parameters of linear regression from the external EOP series of UT1 and polar motion. Finally, the subroutine get_apriori_eop re-formats resulting EOP file to 1) ut1pm.dat and to 2) erp-format for Calc and Solve for using it as an Earth orientation mod-file.

Program requires a parameter: configuration file.

2 How to use

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Usage: get_apriori_eop <configuration_file>

It is convenient to run get_apriori_eop scheduled by cron every night.

3 Configuration file

The configuration file controls the work of get_apriori_eop. It contains directives which are specific for you Analysis Center and assumed not to be changed frequently. The name of the configuration file is passed as an argument to get_apriori_eop.

3.1 Format of configuration file

Configuration file contains records of three type:

1) comments: any line which beginning from ##

2) directives for get_priori_eop: the line which starts from # and which is not a comment line.

Directive consists of three or more words separated by one or more blanks.

Word1 -- symbol # -- directive attribute

Word2 -- keyword

Word3,4... value(s) of the keyword.

Configuration file should contain definition of all keywords and all variables listed in the next subsection.

Descriptions of directives of get_apriori_eop configuration file.

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EXTFMT: Format of the external file.

One of USNO\_FINALS or IERS\_C04.

Comment: USNO\_FINALS file contains \*two\* sort of parameters grouped in left columns (1:134) and in right columns (135:185). Get\_apriori\_eop gets parameters from the left columns only.

URLEXT: URL of the external file which is to be browsed.

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URLEXT2: URL of the second external file which is to be browsed.

The external EOP series may be represented by two files.

The second file overwrites the values defined in the first. The values defined only in the second file are kept untouched. The length of the output file is determined by the first file. If the EOP should be represented with only one file, this field should be NONE.

FILEXT: local name of the external file after it is browsed to the local machine.

FILEXT2: local name of the second external file after it is browsed to the local machine. If URLEXT2 is NONE, then FILEXT2 should be NONE as well.

FILERP: File name of the reference erp file. This erp file should be in erp modfile format.

FILOUT: local name of the output file in erp modfile format.

FILUPM: local name of the output file in binary ut1pm format.  
Program Calc, dbedit and apriori can use files in this format.

WGET\_EXE: Filename with path of program wget. Program wget should be installed before calling get\_apriori\_eop.

FL\_ROT: Flag whether to apply transformation of the external file. The value is one of TRUE or FALSE.

ROT\_FROM: Date of the left boundary of the dates range for which computation of linear regression is done. The right boundary is the date of the last observation which has been reference used for deriving reference EOP series.  
Format: yyyy.dd.mm, for example 2000.01.29 for January 29, year 2000.

WEIGHTS: Flag: which weights should be used for computation of regression coefficients. One of EQUAL or IN are allowed.  
EQUAL means that all weights are 1. IN means that the weight is  $1/\text{DSQRT}(\text{sig\_x}^2 + \text{sig\_r}^2)$  where sig\_f stands for formal uncertainty of external EOP and sig\_r stands for formal uncertainty of reference EOP.

### 3.2 Example of configuration file

```
#####  
##                               ##  
## Configuration file for retrieving USNO finals Earth orientation    ##  
## parameter series to the Goddard Space Flight Center from the United  ##  
## States Naval observatory.                               ##  
##                               ##  
##                               Last update: 01-APR-2005 16:35:06 ##  
##                               ##  
#####  
# URLEXT:  ftp://maia.usno.navy.mil/ser7/finals.all  
# URLEXT2: ftp://maia.usno.navy.mil/ser7/finals.daily  
# FILEXT:  /tmp/usno_finals.fil  
# FILEXT2: /tmp/usno_daily.fil  
# FILOUT:  /data1/save_files/last_usno_final.erp  
# FILERP:  /data1/save_files/last.erp  
# FILUPM:  /data1/save_files/ut1pm.dat  
# WGET_EXE: /users/pet/bin/wget  
# FL_ROT:  TRUE  
# ROT_FROM: 2000.01.01  
# WEIGHTS: IN
```

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Questions and comments about this guide should be sent to:

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