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                    Updates for SOFA Release 18 : 2021 May 11
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Summary of Changes

The changes fall into the following categories:

(1) Introduction of three new support routines. Two deal with
    calculating astrometric places, while the third provides the
    approximate lunar position and velocity. The validation program
    has been duly updated.

(2) A rearrangement of the ANSI C header files sofam.h and sofa.h.
    The consequence of this is that an explicit #include "sofam.h"
    has been added to many of the SOFA functions. Thus developers
    of applications that use constants from sofa.h will now need to
    include an explicit #include <sofam.h>. Further explanation is
    given below.

(3) The year of validity for the leap second (dat) routine has been
    extended.

(4) Typographical and other minor corrections to the documentation.
    Those that are purely typographical (e.g. punctuation) are not
    listed).

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FORTRAN 77 Library
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iau_ATCC13 New support routine to transform a star's ICRS catalog
            entry (epoch J2000.0) into ICRS astrometric place.

iau_ATCCQ   New support routine; a "quick" transformation of a star's
            ICRS catalog entry (epoch J2000.0) into ICRS astrometric
            place, given precomputed star-independent astrometry
            parameters.

iau_dat   Year extended to 2021.

iau_G2ICRS Documentation updated.
iau_ICRS2G

iau_MOON98 New support routine for calculating approximate geocentric
            position and velocity of the Moon.

iau_PLAN94 Documentation updates and corrections.

t_sofa_f   The test program has been updated to include the three new
            routines.

N.B. Both iau_MOON98 and iau_PLAN94 provide only approximate positions
     and do not use IAU endorsed theories.

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ANSI C Library
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sofa.h   The information in both these files has been rearranged to
sofam.h   eliminate problems encountered by C++ developers.
            The change has
            (i) moved the structures from sofam.h into sofa.h and
            (ii) thus eliminated the #include "sofam.h" from sofa.h.
            The consequence of this change for SOFA functions is that
            an explicit #include "sofam.h" has had to be added to some
            of them.

            Previously, sofam.h contained both structure definitions and
            constants, and was #included by sofa.h, which was otherwise
            dedicated to function prototypes. The difficulty was that

short uppercase names in sofam.h were colliding with
                   C++ variables.

                   The consequence of the change for developers is that any
                   application that uses constants from sofa.h will now need an
                   explicit #include <sofam.h>. It should, however, be noted
                   that the contents of sofam.h are not formally part of the
                   SOFA API, and so such an application is vulnerable to
                   future changes. Rather than adding an #include <sofam.h>
                   to applications, it would be better to replicate the needed
                   macros in the user code.

iauAtcc13   New support function to transform a star's ICRS catalog
             entry (epoch J2000.0) into ICRS astrometric place.

iauAtccq   New support function, a "quick" transformation of a star's
             ICRS catalog entry (epoch J2000.0) into ICRS astrometric
             place, given precomputed star-independent astrometry
             parameters.

iauDat   Year extended to 2021.

iauG2icrs   Documentation updated.
iauIcrs2g

makefile   An error has been corrected when using "make check". The
             directory for the include files was incorrect.

iauMoon98   New support function for calculating approximate geocentric
             position and velocity of the Moon.

iauPlan94   Documentation updates and corrections.

t_sofa_c   The test program has been updated to include the three new
             functions.

Cosmetic changes to improve consistency have been made to the ANSI C code.

N.B. Both iauMoon98 and iauPlan94 provide only approximate positions
     and do not use IAU endorsed theories.

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+ SOFA thanks all those who have reported the various issues that go
+ to ensuring the libraries and documentation are kept up-to-date and
+ relevant.
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+ End of updates
+ 2021 May 11
+ +