Summary of Changes
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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.

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  Documentation updated.

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.

ANSI C Library
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sofa.h  The information in both these files has been rearranged to eliminate problems encountered by C++ developers.

sofam.h  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
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