

WG14 N3697

Meeting notes

C Floating Point Study Group Teleconference

2025/08/13: 8:00 AM PDT/3:00 PM UTC

[Please submit proposed changes to these minutes to Jerome or to the group. Revision changes appear at the bottom.]

Attendees

Jim Thomas, Rajan Bhakta, Jerome Coonen, Damian McGuckin, David Hough

Updated agenda plus new items

[https://wiki.edg.com/pub/CFP/WebHome/CFP meeting agenda-20250813-update.pdf](https://wiki.edg.com/pub/CFP/WebHome/CFP%20meeting%20agenda-20250813-update.pdf) – These minutes should be read alongside the agenda, with its many reference links.

Previous meeting notes

<https://wiki.edg.com/pub/CFP/WebHome/n3675.pdf>

Study group logistics

Next meeting: 17 September 2025, 8:00 AM PDT/3:00 PM UTC

ISO Zoom teleconference

Please notify the group if this time slot does not work.

C documents

The latest C2Y draft is N3550 May 2025 <https://www.open-std.org/jtc1/sc22/wg14/www/docs/n3550.pdf>

C23 has been published ISO/IEC 9899, available for purchase. <https://www.iso.org/standard/82075.html>

IEEE 754 liaison

Damian: Meetings largely devoted to the formats. "Basic format" removed, replaced by "standard specified format", with many implications throughout the standard. Likewise, "supported format" is replaced by "supported interchange format" or "supported arithmetic format", as appropriate. Decimal32 and Binary16 are now standard specified formats. There may be a more explicit qualification of the "conversion-from-integer operations" and at least one of the conversion-to-integer operations".

David: At least three editors share responsibility for the document itself.

C++ liaison

None.

WG14 update

Rajan: The big meeting is 2 weeks away. Here are the proposals to be presented: n3535, n3536, n3537, n3500, n3560, n3598, n3646, n3647, n3648.

TS-4 and TS-5 revisions

None.

Carry-over action items from last meeting

Ly: Send email on expanded complex functions

None, closed.

Rajan: Monitor the new WG14 issue tracker re. TS 18661-4, the domain and range error issue, to see the level of interest in making this small fix.

Carry over this item, pending the upcoming WG14 meeting.

Rajan: Bring the N3390 update issue up at WG14 meeting.

Done, closed.

Action items from last meeting

Jim and group: Check changes to [[reproducible]] example in next C2Y draft.

Closed, in disc.

Jim: Submit proposal re. atan2 and ata2pi.

Done.

Jim Submit proposal re. compile time semantics.

Done.

Group: Review the doc list in Rajan's email 3530 before the 25 July WG14 mailing deadline, to ensure that all submitted proposals are included in his list. Contact CFP or Rajan directly with any additions.

[Added after the meeting.] Jim: Contacts Rajan about n3598 – Make text consistent between creal & cimag.

Closed.

Jerome & Jim: Re. the changes of "return value" to "return type", get a document number, submit, and add to Rajan's list.

Done.

Jim: Change the wording of the decouple proposal and update for next meeting. Use the new X to Y form of suggestion, less heavily dependent on colored text.

Done.

Damian: update the source documents for the 3 Annex F topics under consideration.

Done.

Damian: Send note to JeanHeyd, cc CFP, re. missing quotes around the invalid exception.

Done.

Jim: Write a proposal for changes re. "preferred" quantum exponent.

Don.

Jerome: Write a proposal to remove "exp" as an argument name, per Vincent's suggestion.

Done.

Discussion of issues

Follow up on the [[reproducible]] example

Jim: Presents a note from JeanHeyd that recognizes the problem and solicits a new example, perhaps a fixed point bounding box collision example.

Rajan: Suggests that CFP not volunteer.

Jim: Closed, but offered as extra credit to any enthusiasts. Note, this need not be a floating point example.

Decoupling pragmas from headers

Jim: Shows proposal explaining technique to introduce pragmas without the synopsis-style presentation that artificially ties them to headers. No functional change. Action.

Preferred quantum exponent

Jim: Presents a proposal developed with input from Vincent, Action.

Reserved 'exp' used in prototypes

Jerome: Presents a proposal based on Vincent's observation. The background is some intriguing, long-running discussion about "identifiers reserved for all uses" by the standard. Rajan provided some useful reading (far beyond the scope of this simple change).

Jim: The comment about the typography of the "_FloatN" parameterized types should note that the "N" is italic. Jerome will fix. With that change, it's ready to submit. Action.

Removing imaginary I

Jim: Discusses 4 detailed issues with the proposal put forth by Alex Celeste. He will write them up for Rajan to take to the WG14 meeting. Briefly, one expresses the mathematical value $5 + i 3$ as "5.0 + i 3.0" suggesting a computer representation. Damian noted that the associated example uses the unfortunate variable "j", which is the imaginary unit in EE contexts. Another element in the proposal refers to the outdated complex expression the definition of `cproj()`, the topic of much lively CFP chat in this calendar year. Finally, one proposed change seems to refer to text already removed from C2Y.

Jim & Rajan: The proposal does contain a handy choice of two one-line expressions to introduce I just after including `complex.h`. Jim suggests a Note in the `complex.h` section. Rajan suggests that CFP wait for WG14 to respond and then perhaps offer to create a proposal for the "simple" Note.

Jerome: Offers to write the proposal, if needed.

Action.

FE_TOWARDSZERO in C23 and C2Y draft

Jim: This spelling error of FE_TOWARDZERO can merge with missing quotes, next.

Missing quotes in C standard

Jim: Suggest Rajan bring up both the "S" in "TOWARDS" and the missing quotes to JeanHeyd. Action

Annex F - syntax for function special cases

Damian: Presents a proposal for tightening up the language across the broad swath of definitions. Notes that Annex F is pretty solid, but that the real impact will be next, in Annex G.

Jim & Jerome: Jim raises concerns about the phrasing of the problem, leading to some wordsmithing about the discussion of the proposal.

Jim: Recommends backing off on the language about results delivered via pointer.

Action.

Annex F - integer 'n'

Damian: Presents a proposal to remove unneeded "integer" specifiers.

Jim: Notes that these cases are algebraic (that is, mathematical) n. An example is `tanpi()`.

Jerome: Side note, why is the locution "for integers n" with the plural, when the usual language is "for integer n"?

Action.

Other issues

None.

Adjournment

10:04 AM PDT

Action items to be carried over

None.

New action items

Jim: Submit pragma proposal.

Jim: Submit preferred quantum exponent proposal.

Jerome & Jim: Re. the "exp" fix proposal, note the italic face, get a doc number, and submit.

Jim: Write note for Rajan to bring up for WG14 re. removing imaginary I.

Rajan: Call both TOWARDS and missing quotes issues to JeanHeyd's attention.

Damian: In the Annex F syntax discussion, revert to prior wording of stored function results. Clarify a bit of the introductory discussion, too.

Damian: Re. "integer n" proposal, revisit the algebraic versus integer type uses of "n", and adjust the proposal accordingly.

Discussion issues to be carried over

Annex F – Special case domains, signaling NaNs

Output bounds for math functions

Overflow, non-default rounding, errno

Rounding Direction Mode or Rounding Direction or Rounding Mode

F10.1#14

F.10.9.1 - nextafter(x, y)

canonicalize() in AnnexF - F.10.9.7

hypot(x, y) - C2Y F.10.5.4

hypot(x, NAN) in Annex F

Magnitude or Absolute Value or |x| or

Preferred Style in Annex F - fromfp/fromfpx or nearbyint/rint

More complex functions, e.g. ccbt, csinpi

Signoff

Respectfully submitted.

-Jerome Coonen

650.996.4738

jcoonen@gmail.com