

WG14 N3735

Meeting notes

C Floating Point Study Group Teleconference

2025/10/29: 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, Joshua Cranmer

Updated agenda plus new items

<https://wiki.edg.com/pub/CFP/WebHome/CFP%20meeting%20agenda-20251029-update.pdf> –

These minutes should be read alongside the agenda, with its many reference links.

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Previous meeting notes

<https://wiki.edg.com/pub/CFP/WebHome/n3729.pdf> 2025/10/15 Meeting notes

Study group logistics

Next meeting: 12 November 2025, 8:00 AM PST/4:00 PM UTC

ISO Zoom teleconference

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

C documents

The latest C2Y draft is N3685 Sept. 2025 <https://www.open-std.org/jtc1/sc22/wg14/www/docs/n3685.pdf>

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

IEEE 754 liaison

Damian: Further discussion of the wording re. formats.

C++ liaison

Joshua: Next meeting first week of 3 Nov. Two papers on floating point topics: defining fastmath semantics is hard and reproducibility.

WG14 update

Rajan: Next meetings 2-6 Feb 2026.

TS-4 and TS-5 revisions

None.

News

Jerome: 754-1984 40th anniversary meeting is hastily moved from Sat 1 Nov to Sun 2 Nov to avoid collision with Cal football game.

Carryover action items from last meeting

Jim & Jerome: Look further into the language around when errors "occur" in the sense of C2Y and how the setting of errno fits in. Draft a proposal, if appropriate.

Done

Action items from last meeting

Rajan: Submit the proposal regarding translation time expression evaluation.

Done n3732

Jim: Submit the proposal regarding output bounds for math functions.

Done n3731

Jim: Draft a proposal for the language of quantum exponent in nextafterdN.

Done

Damian: Draft Annex F change proposal in two flavors, with modifiers and with double-ended bounds.

Done

Jerome: Follow up on cfp3618 to see whether snan issues apply to more than signbit, and what to do about it.

Carry-over, after much offline discussion with Jim.

Jim: Write a note about the locution of "result" vs. "result value" vs. "return value" in some problematical functions where the language is not best today.

Done, in discussion.

Jim: Add strtodN to list of low-priority issues.

Done, in discussion.

Discussion of issues

Preferred quantum exponent for nextafterdN

Jim: Reviews the language emphasizing the numerical value (vs. representation), in order to bring out the preferred quantum exponent.

Rajan: As mentioned last time, this breaks an implementation that just returns y.

Jim: Action to add mention of the breaking-implementations issue, for purposes of WG14 clarification, and then submit if no objection.

F.3 #7 quiet/signaling NaNs

Jerome: Will follow up on cfp3618 to see whether signaling nan issues apply to more than just signbit, and what to do about it. (NOTE: By popular demand, will start using the "cfp" prefix on CFP-specific docs like the email cfp3618 in this item. This removes ambiguity with WG14 docs precede by n".)

Overflow, non-default rounding, errno

Jerome: Summarizes the changes to (a) emphasize the notion of "error occurs"; (b) consolidate the specification allowing implementation-dependent error reporting; (c) clarifies that the language of over/underflow applies only when the exception is reported.

Jim: Shows how footnote 275 about exceptions involving infinite operands is not required in the specification.

Jerome & Jim: Action to submit.

Annex F changes discussion paper

Damian: Walks through the options for pure inequalities vs. mixed modifiers and inequalities

Group: Much discussion of the issues. Prevailing sentiment was that arguably verbose expressions like

$-\text{inf} \leq x \leq +\text{inf}$

to express "all numbers, finite or infinite" is better than the more terse expressions with cryptic absolute values. The rare cases of "all values, even NaNs" necessarily require some verbiage.

Rajan: WG14 sometimes gets big changes, so it won't be problematical to get a possible update to Annex F with many update.

Group: The issue of footnotes being specific to a single item leads to the suggestion that we use a Note in the body text for matters that pertain to multiple items.

Damian: The cases $\text{atan2}(y,0)$ and $\text{atan2}(0,0)$ are problematical because atan2 is described as computing "the arc tangent of y/x ". I've added language such as "...and raises no "divide-by-zero" floating-point exception to emphasize the case for $\text{atan2}(y,0)$ for finite, nonzero y .

Jim: The standard normally describes when errors DO occur, not when they don't.

Damian: In frexp , based on suggestion, propose removing an existing line about raising not floating-point exceptions if the result is not a signaling NaN.

Jim That might be tied to double double. Best to leave it.

Damian: The change to ilogb is just a reordering of the current language.

Group: Deemed good.

Jim compoundn should not mention "integer" because that implied by the argument n .

Damian: The $\text{hypot}(\text{NaN}, \text{NaN})$ case is subsumed into the case $\text{hypot}(x, \text{NaN})$ with $|x| \neq \text{inf}$.

Damian: Actions.

Rounding modes, terminology

Damian: Suggest change across C2Y to be consistent about "rounding direction mode" terminology, given that there is also a "rounding precision mode".

Rajan and group: Yes, good idea.

Jim: Do we really need to define "result format", a phrase in the current 3.14 (ed. note -- using the numbering in C2Y n3685)?

Jim: After much back and forth, suggest changing the expression to eliminate the usage "result format".

Jim & Damian: Actions.

Other issues

None.

Adjournment

10:02 AM PDT

Action items to be carried over

None

New action items

Jim: Amend the nextafterd proposal with language about the breaking-implementations issue, share with CFP, and then submit if there's no objection.

Jerome & Jim: Submit proposal about error handling and errno.

Damian: Update paper on Annex F, based on long (converging) discussion of the several alternatives, plus the specific discussions of atan2 , frexp , ilogb , hypot , compoundn , etc.

Group: Review Damian's coming Annex F changes and study pow and others which weren't covered in the meeting, for lack of time.

Damian: Clean up 3.14 "correctly rounded result" and research any other usage of that or similar language.

Jim: Draft change to references to rounding precision mode. Circulate to new ad hoc rounding precision mode subcommittee: David, Damian, Jerome, Jim.

Discussion issues to be carried over

hypot(x, y) - C2Y F.10.5.4

Occurs vs shall occur for math errors
"result" vs. "result value" vs. "return value"
SNAN macro location change

hypot(x, NAN) in Annex F
F.10.1#14 editorial issue
canonicalize() in AnnexF - F.10.9.7
Consistency in paragraphs using NaNs
Preferred Style in Annex F - fromfp/fromfpx or nearbyint/rint
Sign of NaN not interpreted
Editorial issues with F.3#6

Signoff

Respectfully submitted.

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