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Interactive comment on "A note on precision-preserving compression of scientific data" *by* Rostislav Kouznetsov

Rostislav Kouznetsov

rostislav.kouznetsov@fmi.fi

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First of all I would like to thank you for constructive comments.

Indeed the implemented rounding introduces a bias of 1/2 ULP of the initial value, i.e about 10ˆ-7 for a single-precision float, and about 10ˆ-16 for double-precision. That fact is worth a note, but I doubt if more advanced rounding techniques are needed in precision-trimming, since, as it has been pointed, the errors of precision-trimming do not accumulate. I am not sure if three extra operations, needed to implement tie-to-even, as suggested in your comment are worth getting rid of an insignificant bias. If one really cares about 10ˆ-7 bias in single-precision, why would they use single precision, and why to apply precision trimming at all?

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Discussion paper

2u-v method was the first trial, which is quite simple to understand. The rounding method currently implemented in nco (4.9.4-alpha07) uses integer arithmetics, namely adding a half-shave mask as an unsigned integer and then applying a bit-shave mask. As it has been pointed in the comment, when adding the mask as unsigned-integer operation, the carry bit leads to the right result even if it reaches the exponent.

Thank you for suggesting the term "seemingly random", that seems to be the right one. I will use that.

As a side note, the comment states that rounding has advantages over halfshave. Indeed that has not been shown. The error norm and computational costs and a bias of halfshave are identical to those of rounding (as it has been implemented, i.e. tie-away-from-zero). The only advantage of rounding is of mostly aesthetic nature: it keeps small integer values intact. Probably, this has to be specified more clearly in the paper.

Also "shavemask = 0x0000_ffff" in the code example from the comment should read as "shavemask = 0xffff_0000".

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