Most all modern computing platforms support the use IEEE 754 floating-point number format standard to approximate real numbers and perform floating point arithmetic operations. Two primary formats defined in the standard are in typical use, single precision four byte floats and double precision eight byte floats. The use of the standard is encouraged to make numerical algorithms portable across computing systems.

Because of the relatively limited accuracy of wellbore survey measurements, the quality of the data being many orders of magnitude less than, may safely be stored in single precision floats, but in lieu of, though not an excuse for not, algorithms not subjected to rigorous numerical analysis should carry out all intermediate arithmetic operations in double precision to minimize the deleterious effects of compounded and accumulated rounding error, catastrophic subtractive cancelation and ill-conditioning.

Further, algorithms that exploit the semantics of the standard tend to enjoy predictable behavior across various platforms that support the standard. Some of the algorithms in this work, to generate stable behavior, exploit/favor the properties afforded by the standard. So in this work, all calculations are assumed to be carried out, and intermediate data stored in full double precision, and that no overflow or underflow occurs as defined by the standard. It is also assumed that the default-rounding mode, round-to-nearest with round-to-even tiebreaker, is in effect.

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Because of the relatively limited accuracy of survey measurements, such data may safely be stored in single precision floats. But, to minimize the potential deleterious effects of rounding errors and subtractive cancellation accumulated through consecutive arithmetic operations, it is recommended that all intermediate operations be performed using double precision floating-point arithmetic.