

Calc Discussion

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- What Calc does.
- What Calc doesn't do.
- What Calc produces.
- What DiFX uses.
- Calc update plans.

What Calc does – computes theoretical delays:

- Computes a solid-body rotation using nutation/precession, polar motion, UT1.
- Computes elastic effects – solid Earth tide, ocean loading, pole tide.
- Computes other effects – atmosphere delay, axis offset delay.
- Computes gravitational deflection from sun, moon, Earth, and other planets.
- Computes relativistic and barycentric transformations.

What Calc doesn't do:

- Doesn't have a finite distance model.
- Doesn't use the currently best atmosphere delay model.
- Doesn't correct for antenna thermal expansion.
- Doesn't correct for pressure loading.
- Doesn't correct for ionosphere delays.

What Calc produces:

- Theoretical delays and delay rates .
- Atmosphere delay and rate contributions (Niell dry and wet model).
- Various other delay contributions.
- Partial derivatives of the delays and rates with respect to precession/nutation, polar motion, UT1, dry and wet atmosphere, axis offset, site position, source position.

What difx uses:

- Theoretical vacuum delays.
- Niell dry and wet atmosphere delays.
- ??

Calc update plans:

- Current version is 10.0 (Fortran 90).
- Difx uses Calc 9.1 (Fortran 77).
- Planning version 11 update for compliance with IERS 2010 Conventions and finite distance model.

What issues are there with Calc?

How can Calc be improved for correlator use?

GSFC is writing a new analysis program, vSolve:

- Will use NETCDF format.
- Using C++.
- No vCalc plans yet.