Overview of a new generation VLBI data analysis software

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VLBI Analysis Workshop
Longyearbyen, Spitsbergen, Norway
June 8, 2018

Software overview

Design

- The software is written in **C++ programming language**.
- The code uses **GNU Build System** to make a distribution portable.
- **Modular structure** of the software keeps it stable and flexible.

Availability

- The source codes of the software are available at **https://vlbi.gsfc.nasa.gov/software/nusolve/**
- The distribution package contains the core library, CALC 11.02 software, νSolve and utilities vgosDbMake, vgosDbCalc and vgosDbProcLogs.
- **User Guides** for each of the utility are provided in the distribution.

Features

- Full **vgosDb IO** support.
- **Automation** of INT sessions.
- **Scripting** with ECMAScript.

Functionality

- **vgosDbMake**: exports data from fringe files and stores them in vgosDb format.
- **vgosDbCalc**: evaluates theoretical values of delay and delay rates, calculates their partials with respect to estimated parameters and stores all these data in vgosDb format.
- **vgosDbProcLogs**: parses station log files, extracts cable calibration corrections and meteorological data and stores them in vgosDb format.
- **νSolve**: performs initial data analysis of a VLBI session.

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Plans for future

Software release of Version 1.0.0

- **Multisession mode** will allow process several VLBI session in one solution.
- **Modeling improvement**: taking into account extended or alternative models.
- **Bugfixes and User support**.

Beyond Version 1.0.0

- **GUI improvement** and switching to Qt-5.
- **Optimization** of data processing time, using mutlithreading.
- Full support of **Stochastic parameters**.

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