

## NAME

vecsol – GPS Vector Solver, computes a 3D vector from RINEX input

## SYNOPSIS

**vecsol** [*RINEX obs file 1*] [*RINEX obs file 2*]

## DESCRIPTION

Computes a 3D vector solution using dual-frequency carrier phases. A double difference algorithm is applied with properly computed weights (elevation sine weighting) and correlations. The program iterates to convergence and attempts to resolve ambiguities to integer values if close enough. Crude outlier rejection is provided based on a triple-difference test. Ephemeris used are either broadcast or precise (SP3). Alternatively, also P code processing is provided.

The solution is computed using the ionosphere-free linear combination. The ionospheric model included in broadcast ephemeris may be used. A standard tropospheric correction is applied, or tropospheric parameters (zenith delays) may be estimated.

## FILES

### RINEX obs files 1 and 2

contain the observations collected at the two end points 1 and 2 of the baseline. They *must* contain a sufficient set of simultaneous observations to the same satellites.

### vecsol.conf

contains the input options for the program, one per line.

### Options

#### **phase** [1/0]

Process carrier phase data (instead of P code data)

#### **truecov** [1/0]

If 1, use true double difference covariances. If 0, ignore any possible correlations

#### **precise** [1/0]

If 1, use precise ephemeris, if 0, use broadcast ephemeris

#### **iono** [1/0]

If 1, use the 8-parameter ionospheric model that comes with the broadcast ephemeris (.nav) files

#### **tropo** [1/0]

Estimate troposphere parameters (zenith delays relative to the standard value, which is always applied)

#### **vecmode** [1/0]

If 1, solve the *vector*, i.e. the three co-ordinate differences between the baseline end points. If 0, solve for the absolute co-ordinates of both end points

#### **debug** [1/0]

If 1, produce lots of gory debugging output. See the source for what it all means

#### **refsat\_elev**

Minimum elevation of the reference satellite used for computing inter-satellite differences.  
Good initial choice: 30.0

#### **cutoff\_elev**

cut-off elevation. Good initial choice: 10.0 – 20.0

### vecsol.nav

contains the names of the navigation RINEX files ("nav files", extension

Good navigation RINEX files that are globally valid can be found from the CORS website at <http://www.ngs.noaa.gov/CORS/>

**vecsol.eph**

contains the names of the precise ephemeris SP3 files (extension .sp3) to be used. These should cover the time span of the observations, with time to spare on both ends.

Note that the date in the filenames of the SP3 files is given as GPS week + weekday, not year + day of year, as in the observation and nav files.

In the .nav and .eph files, comment lines have # in the first position.

**AUTHOR**

Written by Martin Vermeer and others.

**BUGS**

Doesn't currently recover *at all* from cycle slips, so the RINEX observation files used have to be fairly clean already.

Report bugs to <gpstk-devel@lists.sourceforge.net>.

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**SEE ALSO**

The full documentation for the **GPStk** package of which **vecsol** is a part can be found on the website of **GPStk** at

**<http://gpstk.sourceforge.net>**