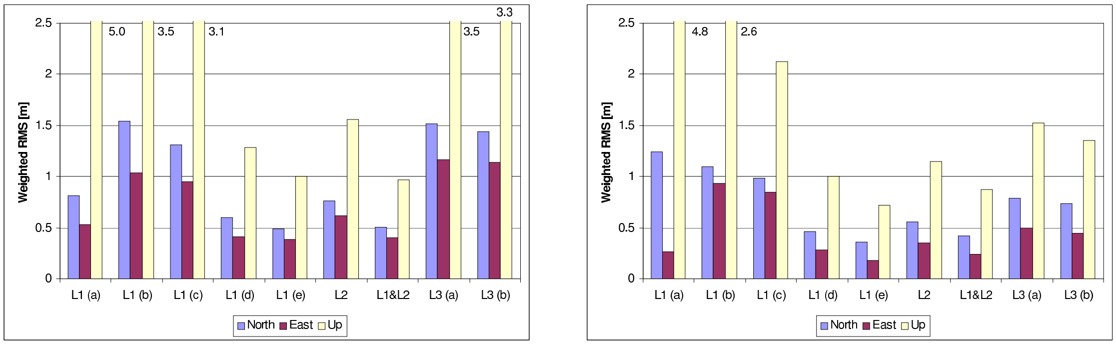

Figure 14: Comparison of navigation solutions concerning C1/X2 receiver class (B), for the IGS stations `NLIB` (left) and `ZIMM` (right).

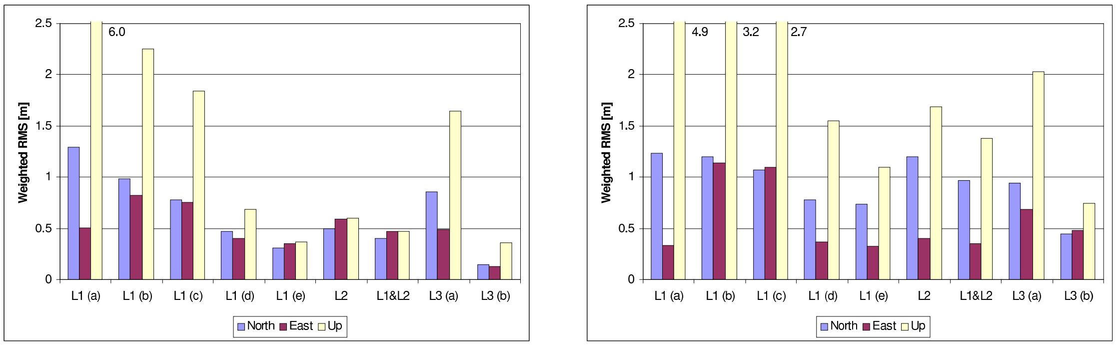

Figure 15: Comparison of navigation solutions concerning C1/P2 receiver class (C), for the IGS stations `PDEL` (left) and `NOUM` (right).

Angelyn Moore from the IGS Central Bureau is acknowledged for creating an extra chart concerning IGS receiver performance.

References

Feltens, J., and S. Schaer (1998), IGS Products for the Ionosphere, in *Proceedings of the IGS Analysis Center Workshop*, edited by J. M. Dow *et al.*, pp. 225–232, ESA/ESOC, Darmstadt, Germany, February 9–11, 1998.

Gao, Y., F. Lahaye, P. Héroux, X. Liao, and N. Beck M. Olynik (2001), Modeling and estimation of C1–P1 bias in GPS receivers, *Journal of Geodesy*, *74*, 621–626.

Gurtner, W. (1994), RINEX: The Receiver-Independent Exchange Format, *GPS World*, *5*(7), 48–52, July 1994, format specifications available at `ftp://igscb.jpl.nasa.gov/igscb/data/format/rinex2.txt`.

Hugentobler, U., S. Schaer, and P. Fridez (eds.) (2001), *Bernese GPS Software Version 4.2*, Astronomical Institute, University of Berne, Switzerland, February 2001.

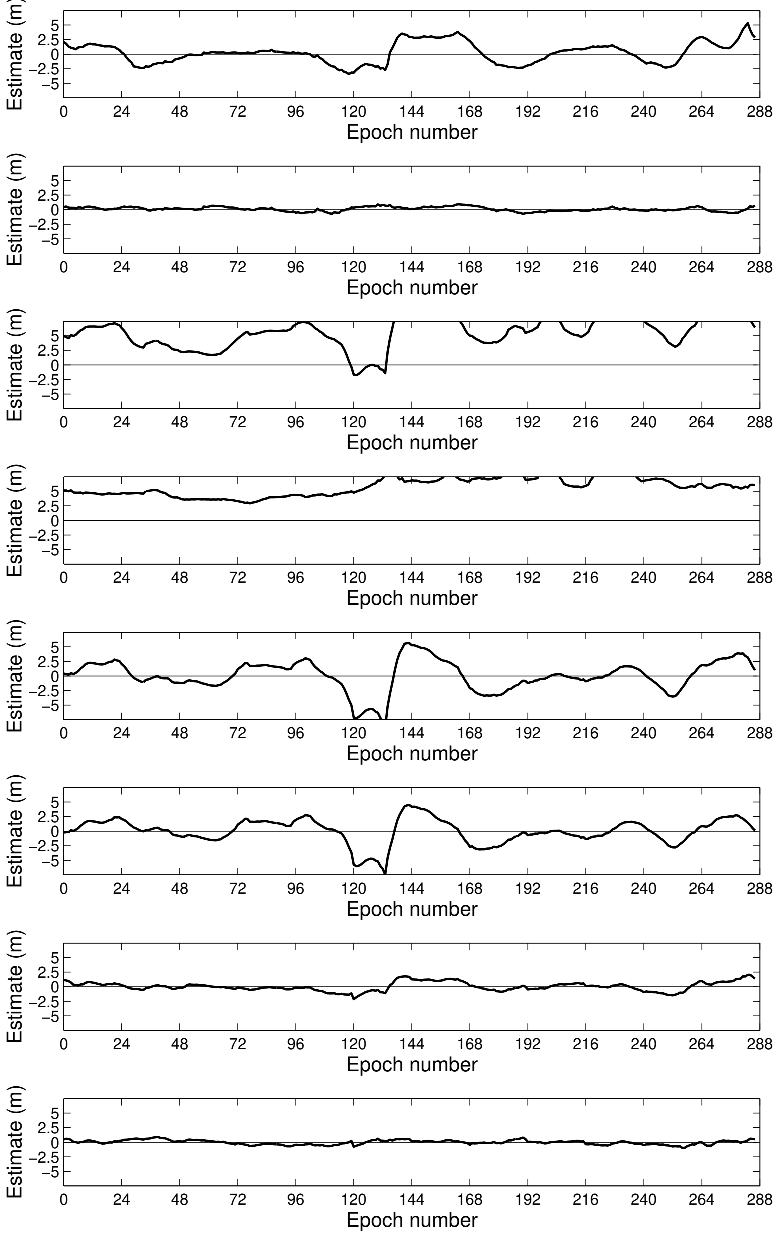

Figure 16: Time series of PDEL up-component station coordinate estimates resulting from the following navigation solutions: L_C (a)—without $B_{P_1-C_1}$; L_C (b)—with $B_{P_1-C_1}$; L_1—without ionosphere model, without $B_{P_1-P_2}/B_{P_1-C_1}$; L_1 (a)—without ionosphere model, with $B_{P_1-P_2}/B_{P_1-C_1}$; L_1 (b)—without $B_{P_1-P_2}/B_{P_1-C_1}$; L_1 (c)—without $B_{P_1-P_2}$, with $B_{P_1-C_1}$; L_1 (d)—with $B_{P_1-P_2}$, without $B_{P_1-C_1}$; L_1 (e)—with $B_{P_1-P_2}/B_{P_1-C_1}$ (from top to bottom).

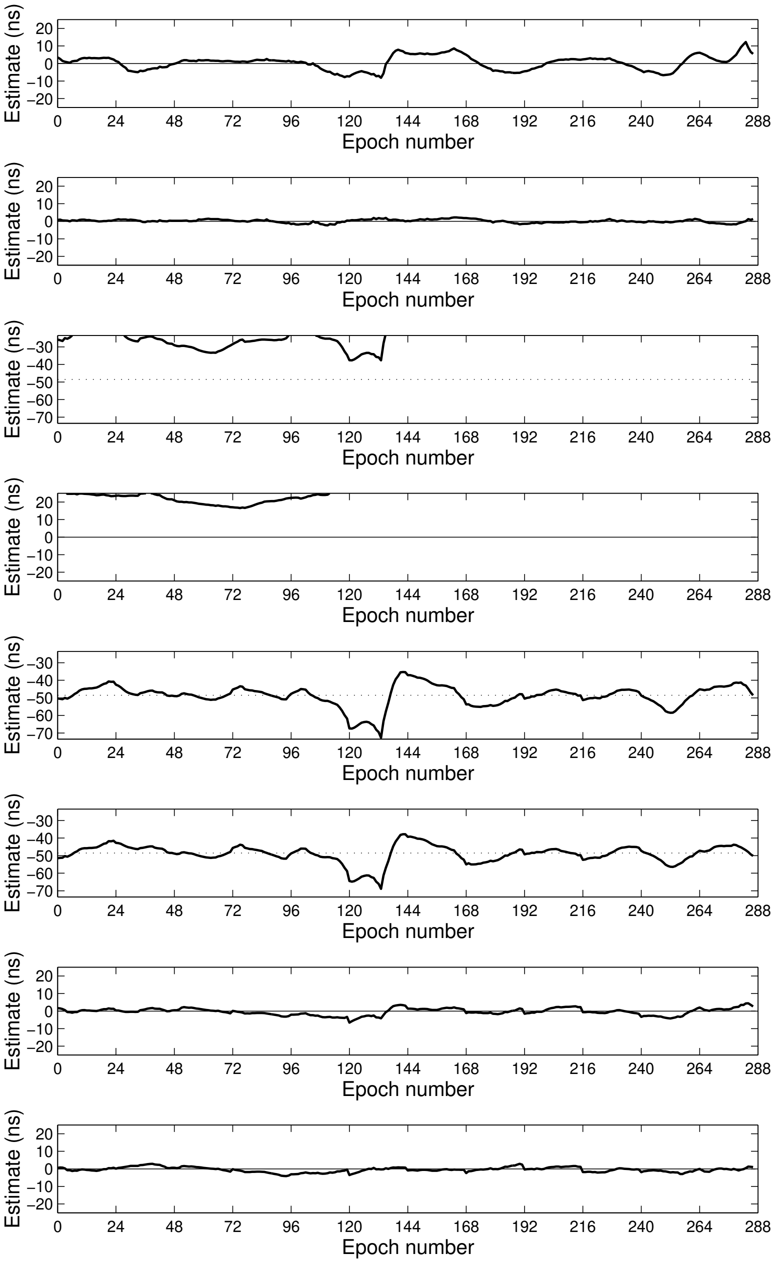

Figure 17: Time series of PDEL receiver clock estimates resulting from the following navigation solutions: L_C (a)—without $B_{P_1-C_1}$; L_C (b)—with $B_{P_1-C_1}$; L_1—without ionosphere model, without $B_{P_1-P_2}/B_{P_1-C_1}$; L_1 (a)—without ionosphere model, with $B_{P_1-P_2}/B_{P_1-C_1}$; L_1 (b)—without $B_{P_1-P_2}/B_{P_1-C_1}$; L_1 (c)—without $B_{P_1-P_2}$, with $B_{P_1-C_1}$; L_1 (d)—with $B_{P_1-P_2}$, without $B_{P_1-C_1}$; L_1 (e)—with $B_{P_1-P_2}/B_{P_1-C_1}$ (from top to bottom).

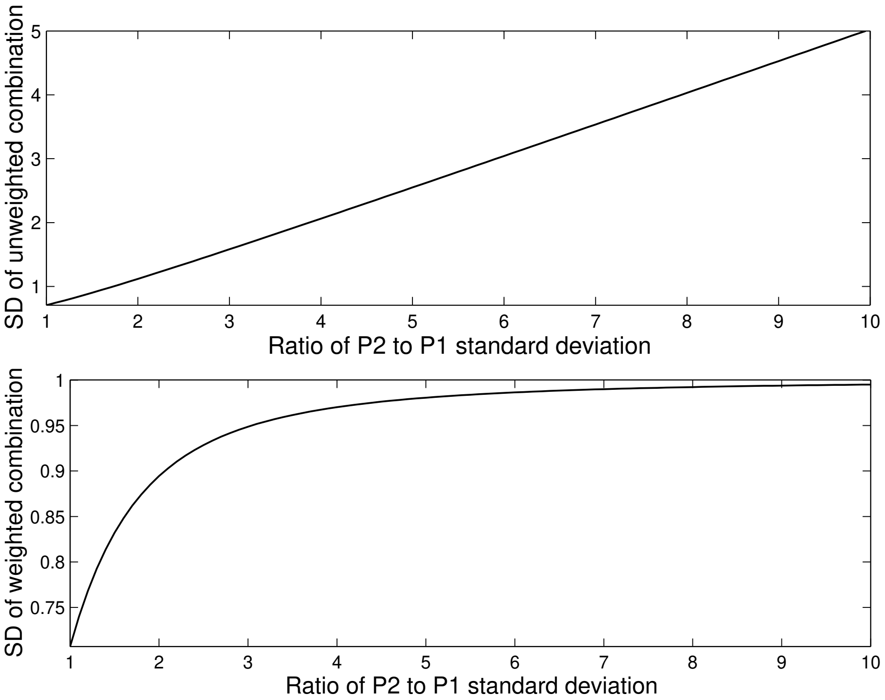

Figure 18: Standard deviation (SD) to be expected for a P1/P2-combined analysis as function of the relative (P1-normalized) P2 standard deviation, for an equally weighted (top figure) and a correctly weighted combined analysis (bottom figure), evaluated in units of the P1 standard deviation.

Jefferson, D. C., M. B. Heflin, and R. J. Muellerschoen (2001), Examining the C1-P1 Pseudorange Bias, *GPS Solutions*, *4* (4), 25–30, Spring 2001.

Mannucci, A. J., B. D. Wilson, D. N. Yuan, C. H. Ho, U. J. Lindqwister, and T. F. Runge (1998), A Global Mapping Technique for GPS-Derived Ionospheric Total Electron Content Measurements, *Radio Science*, *33* (3), 565–582, May–June 1998.

Melbourne, W. G. (1985), The Case for Ranging in GPS Based Geodetic Systems, in *Proceedings 1st International Symposium on Precise Positioning with the Global Positioning System*, edited by Clyde Goad, pp. 373–386, U.S. Department of Commerce, Rockville, Maryland.

Ray, J. (2000*a*), CC2NONCC RINEX converter, source code available at `ftp://igscb.jpl.nasa.gov/igscb/software/cc2noncc/cc2noncc.f`.

Ray, J. (2000*b*), New pseudorange bias convention, IGS Mail Service, 2744, `http://igscb.jpl.nasa.gov`, March 15, 2000.

Ray, J. (2001), Updated P1–C1 pseudorange bias corrections, IGS Mail Service, 3160, `http://igscb.jpl.nasa.gov`, January 9, 2001.

Ray, J. (2002), C1/P1 biases for Leica and Trimble 5700 receivers, IGS Mail Service, 3737, `http://igscb.jpl.nasa.gov`, February 13, 2002.

Ray, J., H. Dragert, and J. Kouba (1999), Handling mixed receiver types: Recommendations for handling non-Rogue data, IGS Mail Service, 2320, `http://igscb.jpl.nasa.`

gov, June 24, 1999.

Rockwell International Corporation (1993), *Interface Control Document (ICD-GPS-200): NAVSTAR GPS Space Segment/Navigation User Interfaces*, October 10, 1993.

Schaer, S. (1998), CODE's Global Ionosphere Maps, http://www.aiub.unibe.ch/ionosphere/, automatically updated web site.

Schaer, S. (1999), *Mapping and Predicting the Earth's Ionosphere Using the Global Positioning System*, Vol. 59 of *Geodätisch-geophysikalische Arbeiten in der Schweiz*, Schweizerische Geodätische Kommission, Institut für Geodäsie und Photogrammetrie, Eidg. Technische Hochschule Zürich, Switzerland.

Schaer, S. (2000), Monitoring P1–C1 code biases, IGS Mail Service, 2827, http://igscb.jpl.nasa.gov, May 9, 2000.

Schaer, S. (2001), CODE DCB data archive initiated, IGS Mail Service, 3212, http://igscb.jpl.nasa.gov, February 23, 2001.

Schaer, S. (2002), Trimble 4700, IGS Mail Service, 3887, http://igscb.jpl.nasa.gov, May 17, 2002.

Schaer, S., W. Gurtner, and J. Feltens (1998*a*), IONEX: The IONosphere Map EXchange Format Version 1, in *Proceedings of the IGS Analysis Center Workshop*, edited by J. M. Dow *et al.*, pp. 233–247, ESA/ESOC, Darmstadt, Germany, February 9–11, 1998, format specifications available at ftp://igscb.jpl.nasa.gov/igscb/data/format/ionex1.pdf.

Schaer, S., G. Beutler, and M. Rothacher (1998*b*), Mapping and Predicting the Ionosphere, in *Proceedings of the IGS Analysis Center Workshop*, edited by J.M. Dow *et al.*, pp. 307–318, ESA/ESOC, Darmstadt, Germany, February 9–11, 1998.

Schaer, S., *et al.* (2002), New Test Solutions Generated as Part of the CODE EUREF Routine Analysis, paper presented at the EUREF Symposium, Ponta Delgada, Azores, Portugal, June 5–8, 2002.

Wilson, B. D., and A. J. Mannucci (1993), Instrumental Biases in Ionospheric Measurements, in *Proceedings of the ION GPS-93*, Salt Like City, Utah, USA, September 22–24, 1993.

Wilson, B. D., C.H. Yinger, W. A. Feess, and Capt. C. Shank (1999), The Broadcast Interfrequency Biases, *GPS World*, *10*(9), 56–66, September 1999.

Wübbena, G. (1985), Software Developments for Geodetic Positioning with GPS Using TI 4100 Code and Carrier Measurements, in *Proceedings First International Symposium on Precise Positioning with the Global Positioning System*, edited by Clyde Goad, pp. 403–412, U.S. Department of Commerce, Rockville, Maryland.