An improved method for eliminating BeiDou satellite induced code bias

Xin Li (1), Xin Li (2), Xiaohong Zhang (1), and Lin Pan (1)

(1) China (lixinsgg@whu.edu.cn), (2) German Research Center for Geosciences (GFZ)

An improved method for eliminating BeiDou satellite induced code bias
Xin Li1, Xingxing Li2, Xiaohong Zhang1, Lin Pan1,

1 School of Geodesy and Geomatics,Wuhan University, 129 Luoyu Road,Wuhan 430079, China;,Wuhan University, 129 Luoyu Road,Wuhan 430079, China;
2 German Research Center for Geosciences (GFZ), Telegrafenberg, Potsdam 14473, Germany;

Abstract: The BeiDou satellite induced code biases have serious impact on precise positioning which use code measurements. According to the characteristic of code biases which have been confirmed orbit type-, frequency-, and elevation-dependent, an improved method is proposed in this contribution by processing the data from 12 months in 2015 to reduce their adverse effects. Different from the model put forward by Wanninger and Beer (2015),more data sets were used to produce the correction values as weighted least squares and robust estimation were used to build up more accurate model for all IGSO satellites and MEO satellites. The additional method for GEO satellites is applying sidereal filtering to help minimize the code biases. The result of improved method shows that the systematic variations have been eliminated more clearly and the positioning accuracy of PPP solution were better than using traditional model proposed by Wanninger and Beer as well as convergence speed. In addition, the systematic variations in MW combination which serve for ambiguity fixing were removed as well. Morever, after application of the code bias correction method, the convergence time of MW combinations and the fixing rate of DD wide-lane ambiguity resolution have been improved.
Key words: BeiDou; code bias; weighted least squares ; robust estimation; Precise Positioning; MW combination; ambiguity resolution