stations at different cut-off altitudes during each track period

From the up of Figure 4, it can be seen that there are 2 satellites can be viewed at least together for each tracking period when the cut-off angle is 30°. From the lower of Figure 4, we can see that there are at least 2~4 at the elevation angle of 15°, and even a few tracking periods will even reach 5 common-view GPS satellites.

We calculated common-view data of the two-station with GGTTS standard format and elevation angle is selected to be 30°. there are at least two common-view satellites for each tracking period due to the multi-channel receiver be used. We have calculated the weighted average of all common-view GPS satellites in the same tracking period by using the weighted root mean square error of each satellite to obtain a time comparison between two stations. Figure 5 shows the change in the calculated synchronization frequency difference between the two stations:

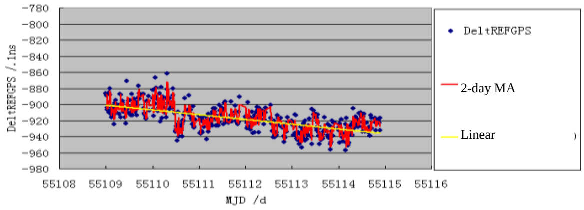

Figure 5: Relative changes in the comparison results between the PTB and USNO stations

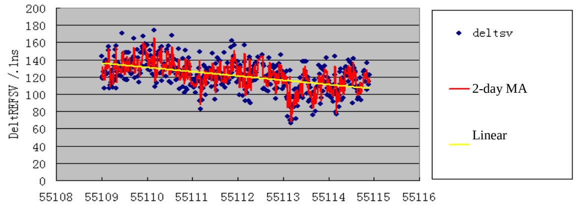

Figure 6: Relative changes in the synchronized value of the two-station frequency marker calculated by BIPM

As we can see from the above two graphs, our results have a same trend with the BIPM results, but there is a clear system difference between the two results, and the difference value can be clearly expressed in the following results. Our result is compared with BIPM's consensus results. The difference (without taking into account hardware delay corrections) are shown in Figure 7:

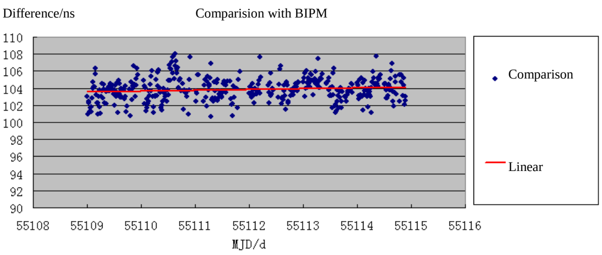

Figure 7: Differences between the results of this paper and BIPM

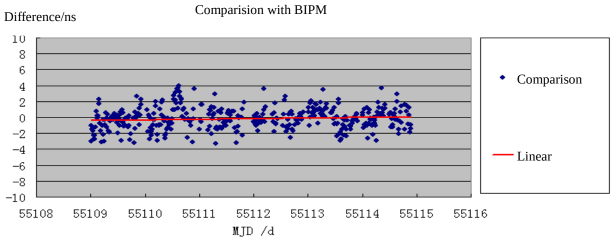

Figure 8: Result of comparison with other factors such as hardware delay.

6. CONCLUSION

This paper processed six days data of station PTB and station USNO. It can be seen from the root mean square error of the REFSV shows a decreasing trend within a week long time, It s tends to be stable. The mean square error shows a linear change, but jump occurs across days. It is estimated that the jumps caused by satellite precise ephemeris is used for interpolation when performing satellite position interpolation. Compared our results with the results obtained by BIPM, we can see that the difference is among 102ns to 106ns which regardless of the hardware delay. The difference is mostly lower than 2ns when we taking into account the systematic bias mainly caused by hardware delay, but occasional differences almost reach 4 ns in individual epoch. The data was processed by using Black Troposphere Delay model, It may be the troposphere delay correction is not completely cleared since the distance between two stations is too long (about 6000 km), and the multi-path effect at each station is also must be considered. For a week-long observation data, the hardware delay is considered to be constant when we processing data, Actually, the hardware delay has slight change within a day and may have a great change within a week which affected by the temperature .The hardware delay must be considered in high accuracy data processing.

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