Activity on Frequency and Time in CSAO

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ABSTRACT

Shaanxi Astronomical Observatory (CSAO), Chinese Academy of Sciences, is National Time Service Center in China. It responds to research of time and frequency as well as time service. Its research fields are:

--Time scale, method for the time keeping;

--Precise time transfer and synchronization;

--Measurement and control of time and frequency with high precision;

--Research on equipment for time system;

--Time service system;

--Time and frequency standard;

In addition, there are short wave station, long wave station and low frequency station in CSAO, which are responsible for dissemination of standard time in China.

1. Introduction on CSAO

Shaanxi Astronomical Observatory, Chinese Academy of Sciences was founded in 1966. The headquarters is located at Lintong, near to Xi'an. Division of time service is situated at Pucheng County with two special radio stations, the BPL long wave station and the BPM short wave station for the time service. Since the CSAO situated nearly in the graphic center of China, it is a reasonable center for time service. The BPM broadcasts the standard time and frequency signal at 2.5, 5.0, 10 and 15 MHz alternately 24 hours a day. The BPL broadcasts the standard time and frequency signal at 100KC, in 1986 it is put into regular operation.

Now, a low frequency station has been set up. It will put regular service.

CSAO was one of the first institutes to be accepted into CAS' "Knowledge innovation plan". The CSAO will become as national center for research and service in the field of time and frequency and rename as National Time Service Center (NTSC).

2. Scientific group:

The NTSC has six scientific groups and a time service division. They are:

--Time scale, method for the time keeping;

--Precise time transfer and synchronization;

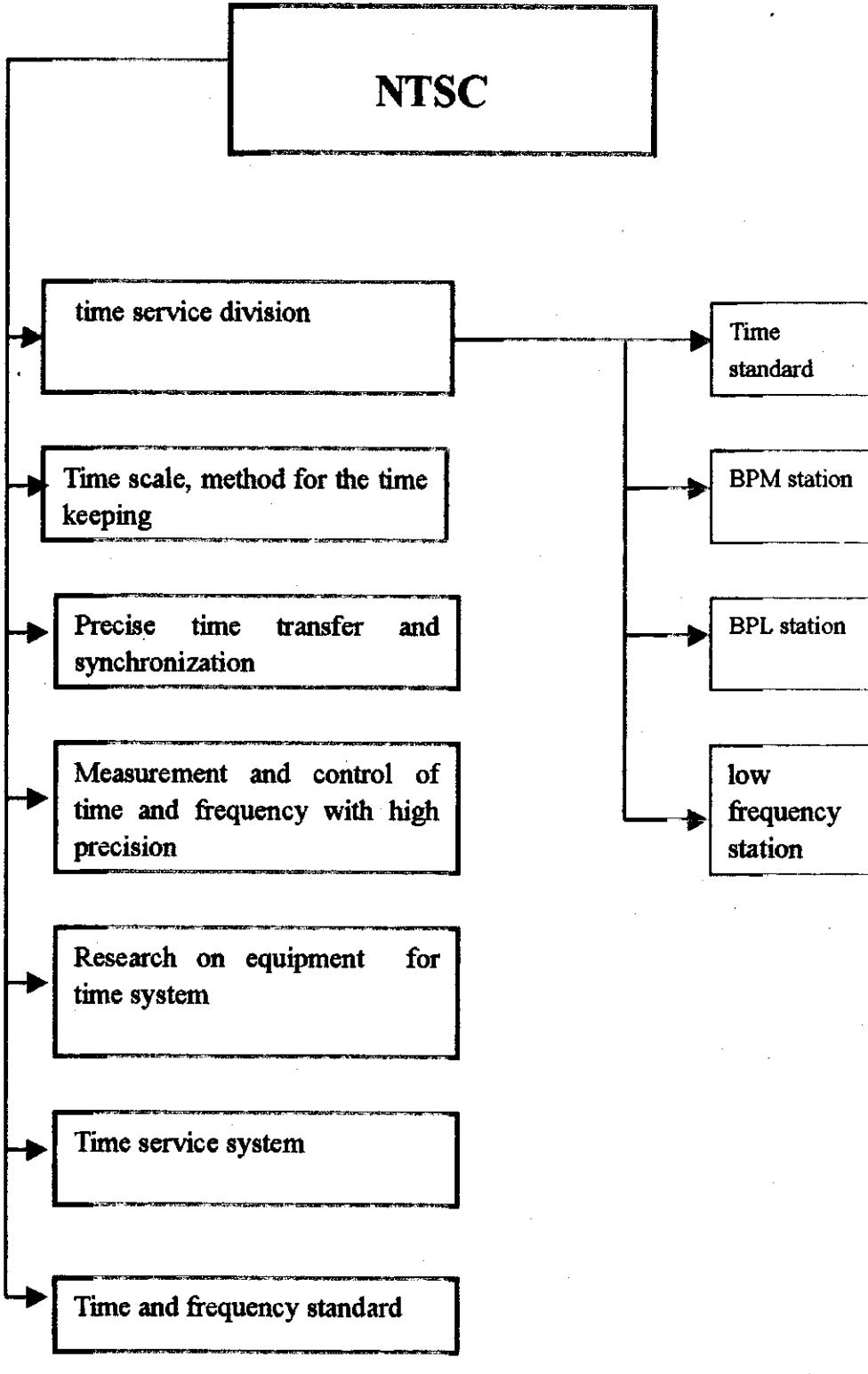
--Measurement and control of time and frequency with high precision;

--Research on equipment for time system;

--Time service system;

--Time and frequency standard;

The scientific groups are as following:


NTSC
time service division
Time standard
BPM station
BPL station
low frequency station
Time scale, method for the time keeping
Precise time transfer and synchronization
Measurement and control of time and frequency with high precision
Research on equipment for time system
Time service system
Time and frequency standard

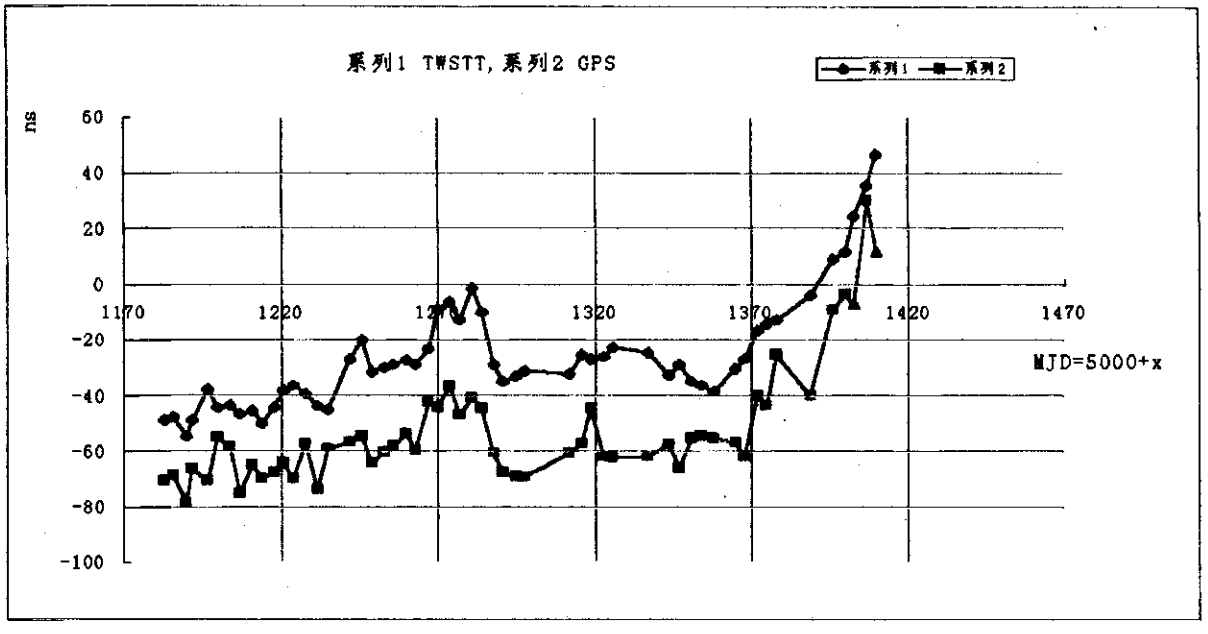
3.TWSTT link between CRL and CSAO

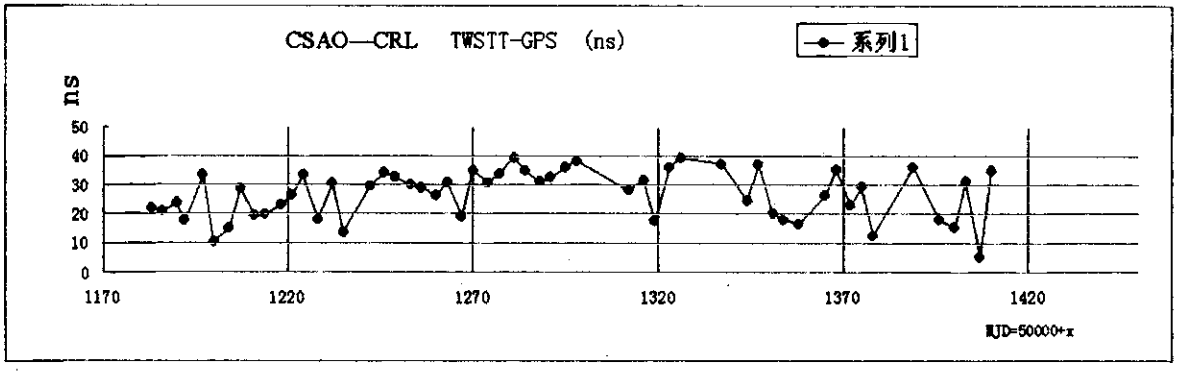
CSAO and CRL are responsible to time service. In 1997, CSAO has equipped new CS Clocks, then the accuracy for time synchronization becomes an urgent problem to be solved. The CRL is a master node of comparison for GPS common view in Asian Both of them try to improve their accuracy of synchronization. So a TWSTFT link was set up by CRL and CSAO. The link has operated since Oct.1998. Further more they have a plan that via CSAO a link between Europe and Asian will try to set up.

4. The result analysis:

To compare TWSTT result UTC(CRL)-UTC(CSAO) [by Mr. Hirotaka Yukawa, CRL] with GPS result UTC(CRL)-UTC(CSAO), we used 55 groups effective data in the period from Jan.1999 to Aug. 1999.

To compare TWSTT and GPS result (CRL— CSAO)



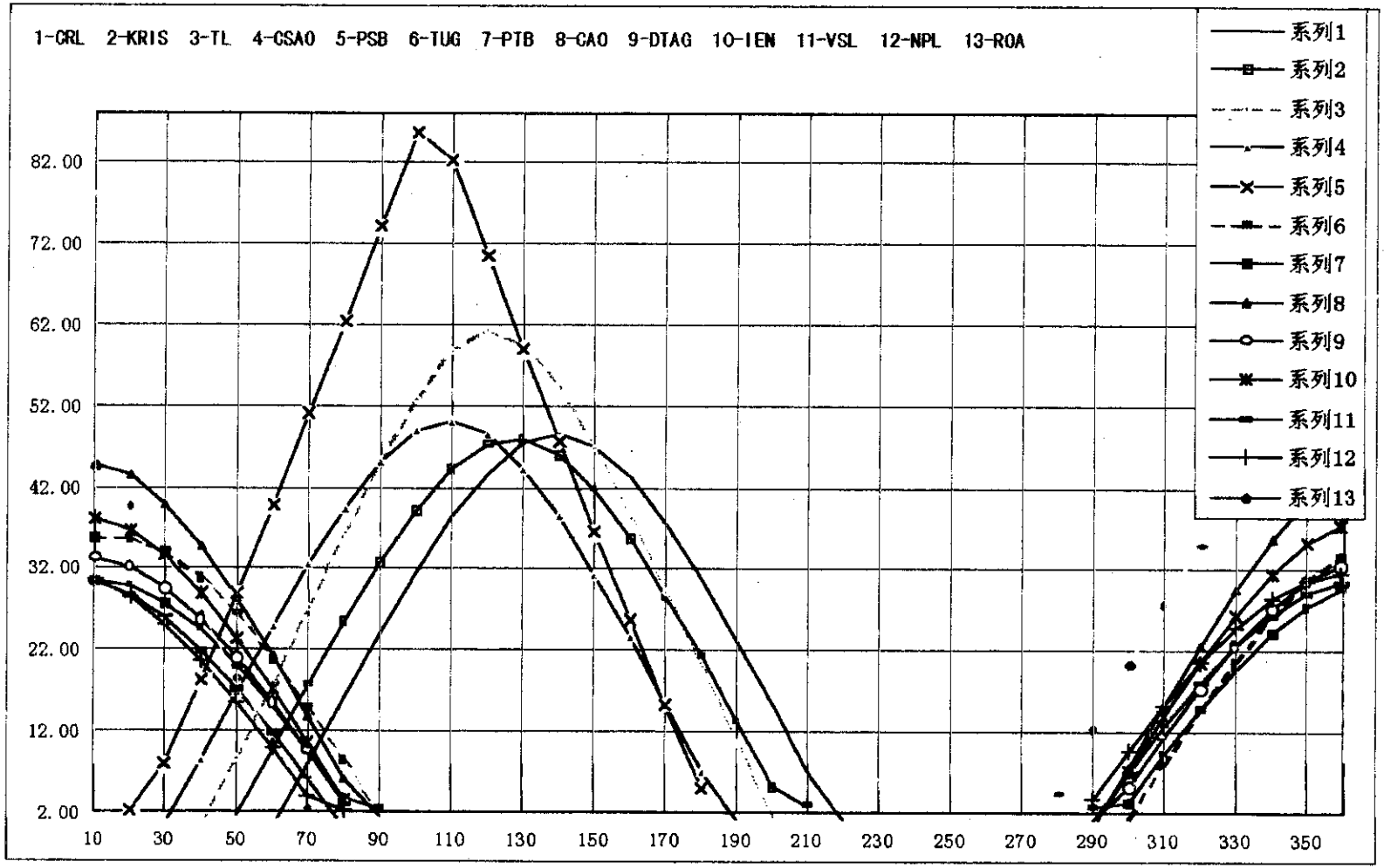


5.Future plan for TWSTFT link:

In the Asian, with CRL effect several institutes have set up their instruments for TWSTFT links. Links in Asian area for TWSTFT are established. Surely, it will improve the exchange of data and contribute data to BIPM for the construction of TAI.

It is time to establish the link between Europe and Asian. CSAO , according to discussion with CRL , tries to set such link . Since CSAO is more close to Europe with other institutes in Asian, it is suitable institute for the purpose.

The following is an investigation: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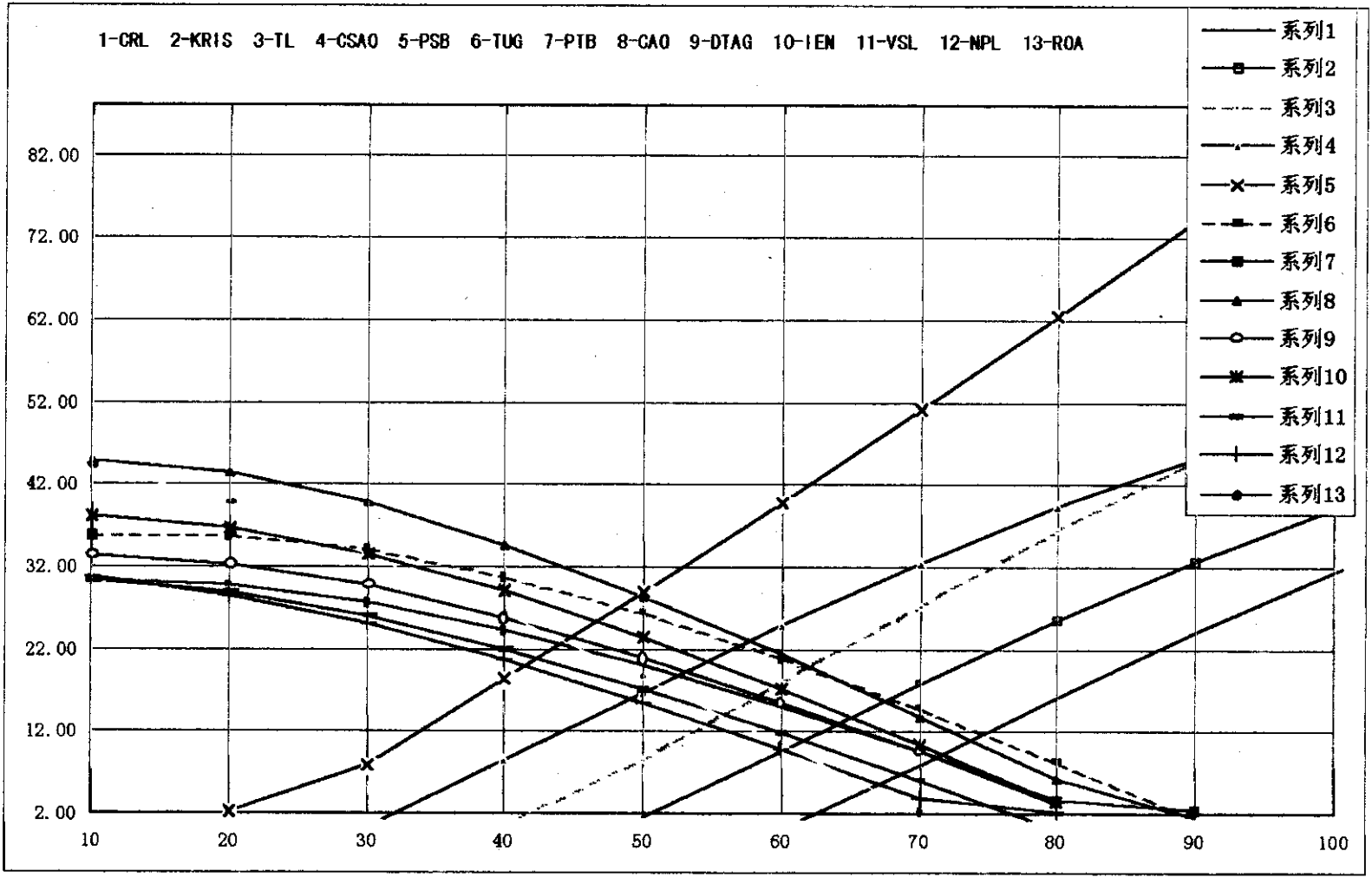
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