



UTC(NPLI) Time Traceability System with Near Real Time Monitoring Using NavIC as Common Clock

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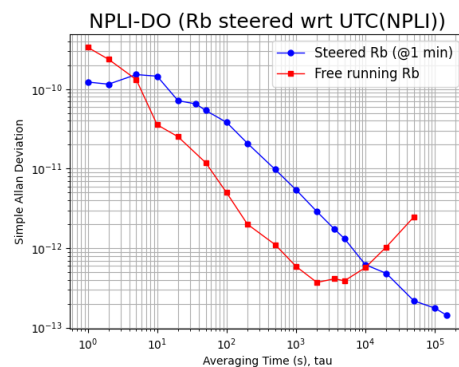
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To provide UTC(NPLI) time traceability to remote locations across India a system is developed which is named as NPLI- Disciplined Oscillator (NPLI- DO). It mainly consists of Rubidium (Rb) as a frequency source and NavIC timing receiver with other signal distribution boards. The system shall be connected to NPLI server for exchange of data and feedback to correct the Rubidium source to be within ± 5 ns the UTC(NPLI) every 16 minutes. NavIC time transfer receiver is used to measure the performance of the Rb with respect to the NavIC system time. The recordings of this measurements by the receiver are exchanged with the NPLI server. At NPLI we have a reference NavIC timing receiver, which records the similar readings and by comparing the NPLI-DO measurements and the NPLI measurements considering NavIC as Common clock the performance of the NPLI-DO shall be known and corresponding corrections are applied to the Rb of the NPLI-DO.

The system shall provide 1 PPS and 10 MHz output for the users to synchronize their systems.



(a)



(b)

Fig 1 (a). NPLI Disciplined Oscillator system and NavIC timing receiver
(b). Stability of the NPLI DO Rubidium w.r.t UTC(NPLI)

The design, integration and development of the system with the mechanism to steer the Rubidium to be within ± 5 ns and frequency stability of steered Rubidium is 10^{-15} w.r.t Free running Rubidium shall be presented in this work.

References:

1. Michael A. Lombardi, "A NIST Disciplined Oscillator", Proc. of 2010 NCSL International Workshop and Symposium, July 25-29, 2010.
2. "Disciplined oscillator system by UTC(NIM) for remote Time and Frequency Traceability", Liang Kun, Yang Hang et.al., 2014 European Frequency and Time Forum (EFTF), IEEE, 23-26 June 2014.