



THE UTC(CNM) TIMESCALE: ITS PERFORMANCE AND PERSPECTIVES

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The UTC(CNM) timescale, the UTC approximation maintained by the Centro Nacional de Metrología, CENAM, the national metrology institute of Mexico, has been produced since 1996. The UTC(CNM) appeared for first time on the Circular T of the BIPM on May 1996 (Circular T 100). Since then, the UTC(CNM) has been progressing in both, accuracy, and stability. In this paper we discuss how the UTC(CNM) has been produced through the years. An evaluation of its performance is presented. We discuss a new algorithm to be used to on the UTC(CNM) production with the aim to largely improve its frequency stability at short time (5 days averaging time). Currently the UTC(CNM) has frequency stability, at five days averaging time, of about 2×10^{-14} . Preliminary results show that with the new algorithm the UTC(CNM) frequency stability at 5 days will improve up to nearly 3×10^{-15} . In Figure 1 (a) we show a calculation of the UTC – UTC(CNM) time differences when the new algorithm is applied. Frequency stability of these data are shown in Figure 1 (b). As a matter of test, the new algorithm was implemented on the UTC(CNM) generation for 100 days (from 60090 MJD to 60190 MJD). Results of UTC – UTC(CNM) time differences during this period of time, published on the Circular T, are shown in Figure 3. It can be appreciated an improvement of the UTC(CNM) stability at 5 days averaging time during that period of time. Expected results of the application of the new algorithm on the UTC(CNM) production are promising.

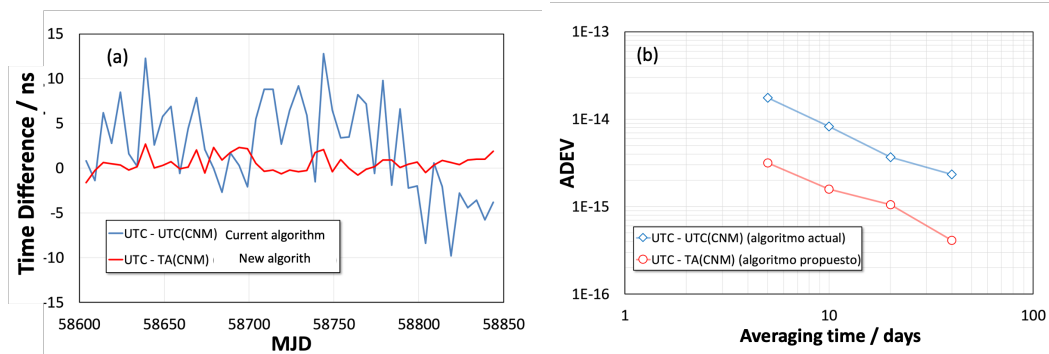


Figure 1. (a) UTC – UTC(CNM) time differences. In blue color data published on the Circular T of the BIPM. In red color, results of UTC – UTC(CNM) when using the new algorithm. (b) Frequency stability for graphs shown in (a).

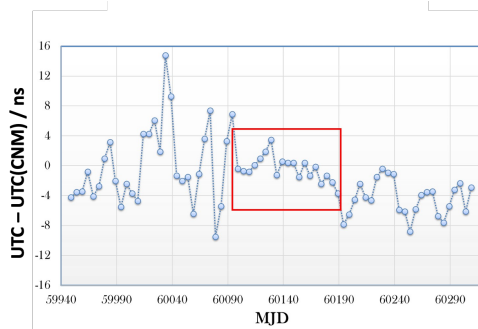


Figure 2. UTC – UTC(CNM) Time differences from January 2023 to December 2023. Data from 60090 MJD to 60190 MJD correspond to the implementation of the new algorithm on the UTC(CNM) production.