



Improvements to the averaged time scale of Mexico to predict UTC

E. de Carlos-López⁽¹⁾, N. Díaz-Muñoz⁽¹⁾, C. A. Ortiz-Cardona⁽¹⁾, F. Jiménez-Tapia⁽¹⁾, and J. M. López-Romero⁽²⁾

(1) Dirección de Tiempo y Frecuencia, Centro Nacional de Metrología, CENAM, km 4.5 carretera a los Cués, El Marqués, 76246, Querétaro, México, e-mail: edlopez@cenam.mx

(2) Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (IPN), CINVESTAV, Unidad Querétaro, Libramiento Norponiente No 2000, Fracc. Real de Juriquilla, Santiago de Querétaro, Querétaro, 76230, México; e-mail: jm.lopez@cinvestav.mx

From the late 1960s, time scales algorithms have been used to generate "virtual clocks" based on an atomic clock's ensemble, whose metrological characteristics are better than any clock member of the ensemble. From its beginnings, averaged time scales were an important tool to generate very high-quality time and frequency standards, maintaining its stability, precision, reliability and robustness characteristics. For several National Metrology Institutes (NMIs), the local realizations of UTC, UTC(*k*), are just based on averaged time scales, TA(*k*). While these averaged time scales perform better than any of the participating clocks, it is necessary to steer TA(*k*) to UTC to generate UTC(*k*).

The Centro Nacional de Metrología (CENAM) has implemented a time scale algorithm for the purpose of achieve better characteristics of stability, accuracy and robustness to UTC(CNM) since 2008 [1]. In this work we report the progress made at CENAM to generate UTC(CNM) using a new approach to calculate the averaged time scale, TA(CNM), with the aim of improve the UTC prediction. We present preliminary results of this new approach using data of two high performance industrial Cs clocks and three active hydrogen masers.

1. J M López-Romero and N Díaz-Muñoz, "Progress in the generation of the UTC(CNM) in terms of a virtual clock", *Metrologia*, **45**, December 2008, pp. S59 –S65, doi:10.1088/0026-1394/45/6/S10.