

Improvements to the averaged time scale of Mexico to predict UTC

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Abstract

The Time and Frequency Direction of the Centro Nacional de Metrología (CENAM) has implemented a time scale algorithm in order to achieve better characteristics of stability, accuracy and robustness to UTC(CNM) since 2008. 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), in order to improve the UTC prediction. We present preliminary results of this new approach using data of four high performance industrial Cs clocks and two active hydrogen masers.

Index Terms

Time scales, atomic clocks, UTC.

I. INTRODUCTION

Since the late 1960s, time scales algorithms have been used to generate "virtual clocks" based on an atomic clocks 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 in order to generate UTC(k). In this work we present the preliminary results of a new TA(CNM) calculation with the aim of improve the UTC prediction.