Continuous operation of INRIM atomic fountain primary frequency standard for real-time generation of UTC(IT)

A new realization of UTC(IT), the Italian national real-time realization of the international coordinated universal time (UTC) is currently under study. A new algorithm, based on a H-maser and a Primary Frequency Standard has been designed and recently tested off-line on experimental data, showing high performances in terms of stability and accuracy of the resulting time scale. Such new algorithm allow better performances when atomic fountain data are available with continuity, therefore a constant operation of the primary frequency standard operating at INRiM laboratories is essential. Currently F2 operates with dead times mainly due to the failures of the optical circuit necessary for the formation of Cs molasses. Moreover, in order to perform a continuous and daily frequency standard evaluation, an automatic control system must be realized. The topic of the doctoral thesis will be to upgrade the optical circuit to make it operational 24 hours a day in order to provide with continuity atomic fountain data, as well as to contribute to the integration of such data to be used for the real-time generation of the Italian national time scale and to the tests for the HW realization of the new UTC(IT).

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Scientific sector (Settore Scientifico Disciplinare - SSD): ING/INF 07 Misure Elettriche ed Elettroniche
Number of international-review papers (last 5 years): 13
Total number of citations and source: 716 - Scopus
h-index and source: 15 – Scopus

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Scientific sector (Settore Scientifico Disciplinare - SSD): FIS/01 Fisica Sperimentale
Number of international-review papers (last 5 years): 23
Total number of citations and source: 2885 - Scopus
h-index and source: 26 – Scopus