

Comparing remote atomic clocks via VLBI networks and fiber optic links: the LIFT/MetGeSp perspective

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Very Long Baseline Interferometry experiments require an extremely precise synchronization between the atomic clocks keeping the time and frequency standards at radiotelescope observatories. Recently the availability of fiber optic links from a few radio observatories and their national metrological institutes has made possible the streaming of extremely stable frequency standards via optical atomic clocks (even two order of magnitudes better than Rubidium or Hydrogen maser standards).

Firstly, I will present the infrastructure of the Italian Link for Frequency and Time (LIFT) and results of the MetGesp project aimed at finally creating a common clock between two of the antennas of the VLBI Italian Network. Secondly, I will show the results of VLBI experiments in which the rms phase noise was used to accurately compare the synchronicity of atomic clocks located at a few EVN sites (Medicina, Noto, Yebes, Torun, Metsahovi). VLBI clock timing proves a valid alternative to satellite-based techniques such as Global Navigation Satellite System or Two-Way Satellite Frequency and Time Transfer.