



Experiments of time elapse comparison of two hydrogen clocks based on two-way satellite time and frequency transfer

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Since optical atomic clocks in laboratory have achieved a stability and accuracy of $10E-18$ level, scientists expect near-future potential applications of precise clocks in geoscience, including for instance the geopotential measurement and world height system unification. Here we provide time ticks comparison between a fixed hydrogen clock and a portable hydrogen clock using the two-way satellite time and frequency transfer (TWSTFT) technique. After comparing the time ticks of two hydrogen clocks at the positions at the same height level for a period, they were separated for a height difference and compared again for a period. Experimental results are expected to confirm the general relativity theory and may provide technical details for future actual applications of precise clocks in geodesy. This study is supported by National 973 Project China (grant No. 2013CB733301 and 2013CB733305) and NSFCs (grant Nos. 41174011, 41429401, 41210006, 41128003, 41021061).