

Celestial tidal effect on clock comparison

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With the rapid development of the clock technology, the unprecedented accuracy and stability provides a potential to measure the solar gravitational redshift with the clock-comparison experiments in the laboratory. The clock-comparison model is discussed in both the Barycentric Celestial Reference System (BCRS) and the Geocentric Celestial Reference System (GCRS), in which the transformations of the coordinates and the metric related to the gravitational potential between the two systems are also analyzed. In the GCRS, one must note that the influence of external matters (such as the solar and moon) on clock comparison should be treated as the tiny tidal potential, which has been suppressed due to the equivalence principle.

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