



Optical clocks and their contribution to gravity modeling

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Optical clocks, as one of the latest achievements in atomic and molecular physics, have applications more than timing, due to their accuracy and stability. In general relativity, gravitational potential differences in space and time, cause frequency difference in optical clocks. Hence, ultra precise optical clocks can be used as a tool to observe potential differences and consequently as a new gravimetry technique. In this contribution, we investigate the latest optical clocks based on atomic transition in Al⁺ and derive a simple equation for frequency change related to geo-potential differences. Moreover, we consider the capability of optical clocks for gravity modeling in combination with other gravity observations. Finally, the possibility to detect potential changes in geo-dynamically active zones, such as East-Asia and the requirements for such studies are discussed.