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Physical Metric, Gravitational Waves and Dark Energy

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Dark energy is not needed to explain the rate of acceleration of the universe. The improvement in the accuracy of time delay experiment data combined with the physical metric produces the correct model to prove/predict the rate of acceleration of the universe. The measurement of time delay experiment data of the solar system has been improved by the use of the Cassini satellite as a reflector, instead of using planets. The data accuracy is now 1 in 10^5. This data does not fit the Schwarzschild metric. The metric that fits the data was introduced by the Author and is called the "Physical Metric". In the Physical Metric, the radius of compact objects, black holes and neutron stars, becomes 2.60 times the Schwarzschild radius, which is called the extended horizon. The enhancement of the size of black hole requires a change in the analysis of the observed gravitational waves by the merger of black holes. The masses in a black hole merger in the LIGO event, GW150914, should be 14 and 11 Solar Mass, instead of reported 36 and 29 Solar Mass. By coordinate transformation between the Physical Metric and the Friedmann metric, one can predict the universe expansion acceleration rate. It is a result of the repulsive nature of gravity inside the extended horizon for the Physical Metric. In other words, dark energy is not needed for the explanation of acceleration of the universe. It is a natural result of the Physical Metric, which fits the data of time delay experiment correctly.

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