Light propagation in time-dependent gravitational field (Poster No. 4)

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JGRG20 Kyoto 2010/9/21-25

- We will attempt to calculate light propagation in time-dependent gravitational field.
- Recently, as a novel approach to compute the null geodesic, time transfer function method is proposed by French group at Paris Observatory (Le Poncin-Lafitte et al. 2004, Teyssandier and Le Poncin-Lafitte 2008).
- It is based on Synge's world function $\Omega(x_A, x_B)$ and avoids integrating the null geodesic equation.
- Adopting this approach, we calculate the round-trip time of light/signal in Robertson-McVittie (RM) spacetime.
- We also apply results to the secular increase in Astronomical Unit reported by Krasinsky and Brumberg (2004).
- We show that time-dependent term due to cosmological expansion cannot explain observed value $d\mathrm{AU}/dt = 15 \pm 4$ [m/cy].