Speed of Gravity

In General Relativity (GR), the speed of gravity is ignored or assumed to be infinite (*warped space-time* explanation). In Special Relativity (SR), gravity is restricted to the same maximum velocity as the speed of light.

The speed of gravity — What the experiments say (Tom Van Flandern)

> The most amazing thing I was taught as a graduate student of celestial mechanics at Yale in the 1960s was that all gravitational interactions between bodies in all dynamical systems had to be taken as instantaneous.

> Orbiting bodies do accelerate through space even if gravity is due to geometry and not a true force. For example, one spacecraft following another in the same orbit can stretch a tether between the two. The taut tether then describes a shorter path between two points in space than the one followed by the spacecraft.

> So are gravitational fields for a rigid, stationary source frozen, or are they continually regenerated? Causality seems to require the latter. If such fields are frozen, then what is the mechanism for updating them as the source moves, even linearly? Even a "rigid" bar pushed at one end would not move at the other end until a pressure wave had propagated its entire length. Moreover, we seem to need two mechanisms - one to curve space-time when a mass approaches, and another to unbend it when the mass recedes. This is because, once a curve is "frozen" into space-time, it will not necessarily "melt" back to its original condition when the cause is removed. Yet, there is no available cause for either process to result from a field with no moving parts.

Line of sight between satellites

If satellites orbited because they were following the curvature of space, then line of sight communications would not trace a shorter path between satellites and would not be blocked by the Earth. The RF beam would follow a similar curved path and curve around the Earth.

https://www.researchgate.net/figure/Distance-between-two-satellites-7_fig3_328133212

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