Review of: "Speed of Gravity: A Simple Experiment to Test the General Relativity TheorySankar Hajra"

Gianfranco Spavieri[1]

1 Universidad de Los Andes

Potential competing interests: No potential competing interests to declare.

Hajra's paper is certainly interesting.
According to Hajra and other physicists, there can be a correlation between solar activity and quake activity on Earth. If confirmed, we may assume that it is due to the action of gravity from Sun to Earth.

For Newton, the action takes place instantaneously, while it takes a delayed time if its speed is that of light, as Einstein predicts.
We know that the fluctuations of solar activity are directly observable and reach the Earth with a time delay of 499 seconds.
Then, as Hajra points out, matching solar fluctuation with seismic activity, it is possible to determine the time lag of 499 seconds between the gravitational effects and electromagnetic effects propagated from the Sun to the Earth.
Actually, both Newton and Einstein can be wrong and it is possible that gravitational perturbations travel at a finite speed, but different from c. Experiment can tell.

What is important is that Hajra succeeds in pointing out one of perhaps many other possible tests for the speed of gravity, likely all cheaper than the LIGO and VIRGO experiment.

Regarding the feasibility of the LIGO and VIRGO experiment for detecting GW, based on the assumption of light speed invariance, it should be highlighted that the evidence of the constant one-way light speed is questionable [1].
What has been measured is the "constant" two- way average speed "c" on a round trip, not the one-way speed.
For a moving closed contour, the one-way light speed is not invariant and, in the Sagnac experiments, is c+v, or c-v [2], [3].
Besides, from the reciprocal linear Sagnac effect [4], [5], [6] it can be inferred that, if an interferometer receives a short impulse, the speed of light is no longer constant on the interferometer rest frame, which may result in a phase-shift variation.

In the LIGO and VIRGO GW experiment, the interferometer can receive all sort of impulses, besides that due to the gravitational wave.

If, moreover, light speed cannot be assumed to be invariant in general, and even less in an uncharted stretching or compressing space, it seems unlikely that phase-shift variations of the interferometer can be attributed to GW and not to any other possible causes.

Thus, I can only agree with Hajra's conclusion.

References

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