

Research on Spacetime dynamics

Created: 2026-06-20
Author: Eckhard Kantz
Website: <https://mvp.wegalink.eu>

Objective

This document describes a concept for conducting private research on Spacetime Dynamics. In opposite to professional Gravitational Waves Detectors it aims at a low budget for required hardware components.

Measurement principle

A spacetime dynamics measurement system consists of a local oscillator which signal is sent through a delay line and which subsequently is brought to interference with the oscillator signal. The phase difference between those two signals carries the information about the dynamics of spacetime deformations.

Professional systems

Known gravitational waves detector systems like LIGO (<https://de.wikipedia.org/wiki/LIGO>) or VIRGO use laser beams that are sent back and forth in two pipes which are perpendicular to each other. When the signals from both pipes are brought to interference, the phase between the two signals carries information about relative length deformations of the two laser beam light ways inside the pipes. Latest improvements introduced 2023 resulted in a sensitivity of the instrument of $10e-22$ which is equivalent to the thousandth part of a proton.

Flow of time variations

Einstein's General Relativity Theory describes a close relationship between a deformation of space and an immediate flow of time variation. Thus the measurement of flow of time variations can be assumed to be equivalent to measuring space deformations like with the Gravitational Waves detectors. The measurement principle that has been described above delivers variations of the flow of time as output signal of a spacetime dynamics measurement system.

Spacetime dynamics sources and signals

Whenever there is a sudden, huge change of a local energy state this will result in the emission of a tiny gravitational wave according to Einstein's General Relativity Theory and to the equivalence of energy and mass:

$$E = mc^2$$

Those sudden, huge local energy outbreaks happen frequently inside and on the surface of our Sun. Furthermore, an emergency shutdown of a nuclear power reactor also causes such a sudden, huge change of the local energy state.

Characteristic parameters

A spacetime dynamics measurement system converts a spectrum of those signals to electrical signals, very similar to a radio which converts the modulation on electromagnetic waves to audio signals. Essential conversion parameters are:

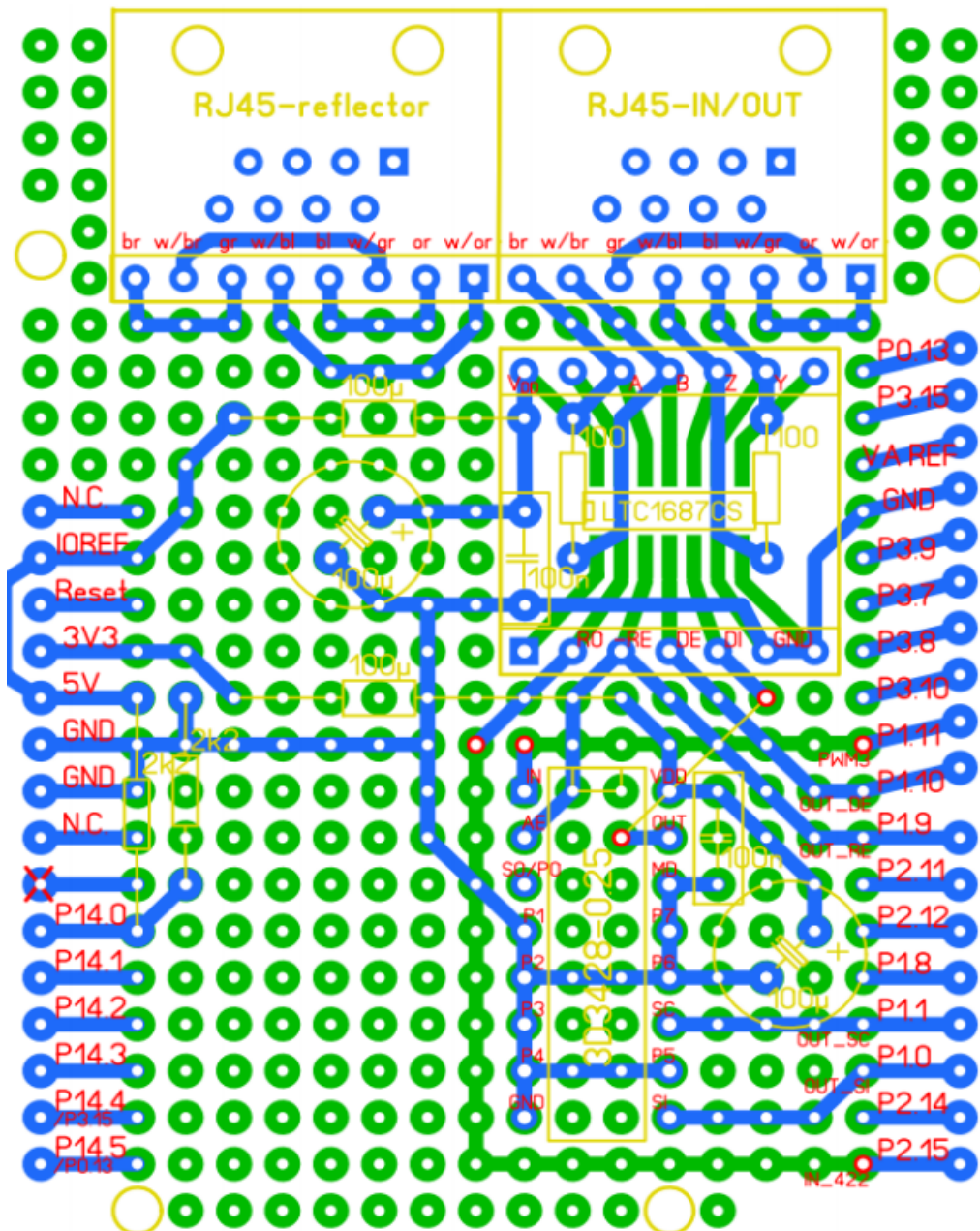
1. Signal delay in the delay line (determines lowest usable signal frequencies)
2. Phase sampling rate (determines highest usable signal frequencies)
3. Time resolution (describes smallest detectable time/space deformations)

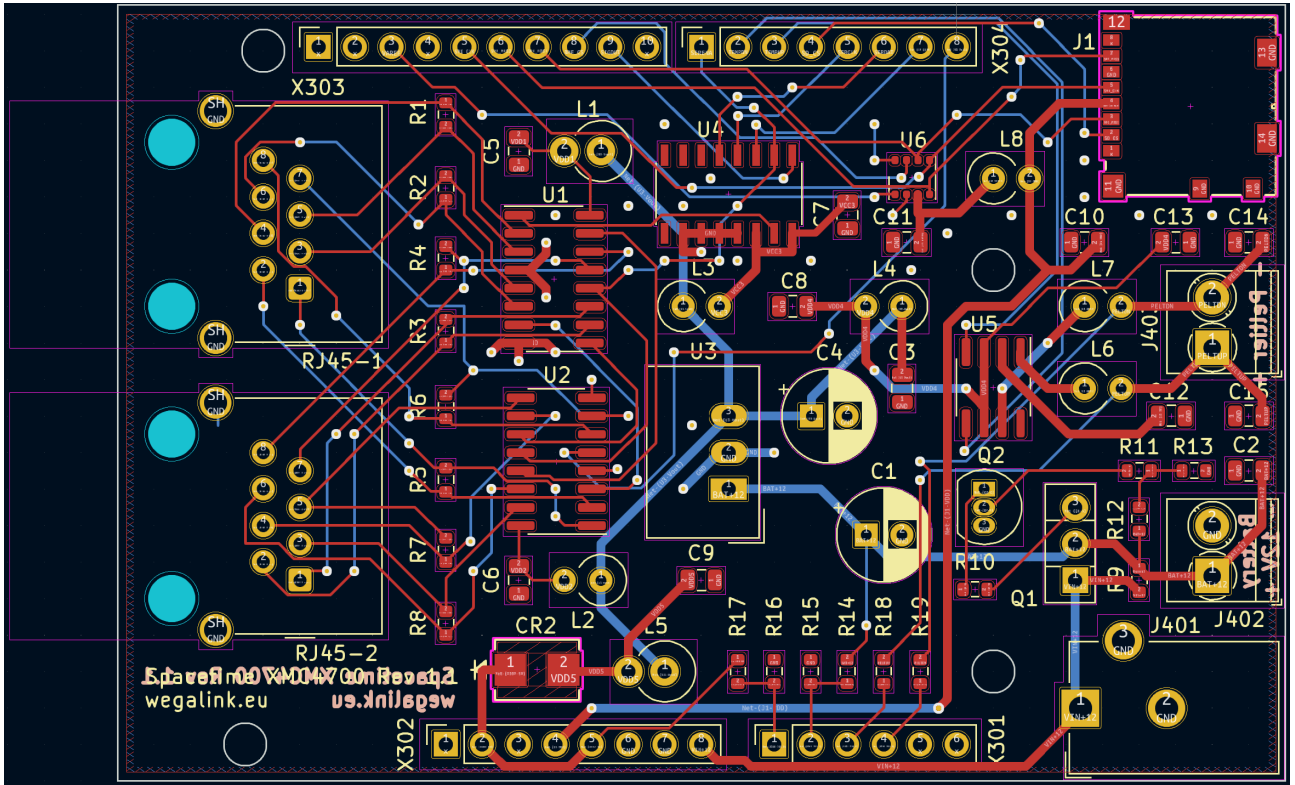
Proof-of-concept measurement system

A preliminary measurement system was operated from 2007 to 2009. After thoroughly removing electromagnetic interference coming from the environment, the system still delivered some magic signals, e.g. 13 pulses about 0.2 dB above noise level which are exactly 3604 seconds apart from each other and which also repeated multiple times with a lower number of occurrences but with the same distance from each other after a couple of weeks and months.

In order to get an independent verification of signals, a distributed measurement system was designed and installed with the intention to get a confirmation of spacetime dynamics signals e.g. from our Sun, by a correlation of output signals in locations that are hundreds of kilometers away from each other.

That proof-of-concept measurement system was manufactured as Arduino shields on a universal PCB which is connected to a microcontroller board with a XMC4700 MCU from Infineon:





wegalink.eu wegalink.eu

Measurement system variants

The following variants of measurement systems are intended to be operated with different cable types and lengths. They implement either a digital or an analog approach and will thus provide different characteristic parameters:

A - Amateur (digital proof-of-concept system)

B - Basic (improved digital system on a designed PCB)

C - Comparator (200 MHz analog system based on a AD8302 phase comparator)

D - Digital (digital system with high driving power for longer cables)

E - 600 MHz (analog system with AD8302 for higher frequencies)

F - Fiber (digital system for fiber cables)

G - Gigahertz (analog system with AD8302 on highest frequency 2.5 GHz)

H - Hydrogen (same as G but longer cables for 1420 MHz hydrogen line research)

Characteristic parameters

LIGO - Time resolution estimated from half wavelength: $300\text{nm}/c = 1\text{ fs}$ ($10\text{e-}15\text{s}$)

A - Amateur

- Connector: RJ45
- Cable: 100m network cable Cat 6a
- Effective length: $4 \times 100\text{m} / 0.66 = 600\text{m}$
- Sampling rate: 400 kHz (modulation: 400 Hz using 1000 samples)
- Time resolution: 500 fs (1000 samples on 500 ps signal edge)

B - Basic

- Connector: RJ45
- Cable: 330m (1000ft) network cable Cat 5e
- Effective Length: $4 \times 330\text{m} / 0.66 = 2000\text{m}$
- Sampling rate: 1 MHz (modulation: 1 kHz using 1000 samples)
- Time resolution: 500 fs (1000 samples on 500 ps signal edge)

C - Comparator

- Connector: RJ45
- Cable: 330m (1000ft) network cable Cat 5e
- Effective Length: $4 \times 330\text{m} / 0.66 = 2000\text{m}$
- Injection frequency: 200 MHz
- Sampling rate: 3.6 MHz
- Time resolution: 1400 fs (0.1 degree phase resolution @ 200 MHz)

D - Digital

- Connector: RJ45
- Cable: 1000m network cable
- Effective Length: $4 \times 1000\text{m} / 0.66 = 6000\text{m}$
- Sampling rate: 1 MHz (modulation: 1 kHz using 1000 samples)
- Time resolution: 500 fs (1000 samples on 500 ps signal edge)

E - 600 MHz

- Connector: RJ45
- Cable: 200m network cable Cat 7
- Effective Length: $4 \times 200\text{m} / 0.66 = 1200\text{m}$
- Injection frequency: 600 MHz
- Sampling rate: 3.6 MHz
- Time resolution: 500 fs (0.1 degree phase resolution @ 600 MHz)

F - Fiber

- Connector: RJ45
- Cable: 100m fiber cable
- Effective Length: $2 \times 100\text{m} / 0.66 = 300\text{m}$
- Sampling rate: 1 MHz (modulation: 1 kHz using 1000 samples)
- Time resolution: 20 fs (1000 samples on 20 ps signal edge)

G - Gigahertz

- Connector: F-type
- Cable: 200m Sat cable
- Effective Length: $200\text{m} / 0.66 = 300\text{m}$
- Injection frequency: 2.5 GHz
- Sampling rate: 3.6 MHz
- Time resolution: 110 fs (0.1 degree phase resolution @ 2500 MHz)

H - Hydrogen

- Connector: N-type
- Cable: 400m Aircell-7 cable
- Effective Length: $400\text{m} / 0.66 = 600\text{m}$
- Injection frequency: 1420 MHz
- Sampling rate: 3.6 MHz
- Time resolution: 200 fs (0.1 degree phase resolution @ 1420 MHz)