

# On graviton emission, and the variability of the gravitational interaction strength

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## Abstract

The emission of gravitons by a mass is considered.

## 1 On the compactification of the gravitational field

It is assumed that the number of gravitons emitted from a kilogram of mass per second is some finite, countable number. In other words, it is assumed that the gravitational field is, in reality, quantized, and the quanta are gravitons. These gravitons propagate at the speed of light in vacuum  $c$ .

In gravito-hydrodynamically-bound systems like the Sun, a mass is an omnidirectional graviton emitter. However, if one is to increasingly gravitationally stimulate a mass, then the stimulation will eventually turn that mass from an omnidirectional graviton emitter into a unidirectional graviton emitter – a mass reciprocates gravitons toward the gravitational stimulation, *in lieu of* the mass's usual omnidirectional graviton emission. For a perfectly unidirectional graviton emitter, the strength of the gravitational interaction would increase by a factor of  $c^2$ , because the gravitational field (a bunch of gravitons) would be compactified from a (3+1)D field down to a (1+1)D beam. A perfectly unidirectional graviton emitter would be a GASER (the gravitational analogue of the electromagnetic LASER).

In gravitationally-bound systems like the Milky Way, it is the inherently anisotropic gravitational interaction of the galaxy that makes the gravitational interaction stronger than that found in gravito-hydrodynamically-bound systems. For instance, the galaxy is a (3+1)D ball at the centre, and is more and more like a (2+1)D disk the further from the centre one goes. The strength of the gravitational interaction would increase as the shape goes from (3+1)D to (2+1)D, and in the case of a perfectly flat (2+1)D disk, this compactification of the dimension would make the gravitational interaction stronger by a factor of  $c$ . From this perspective, it is seen that dark matter is not absolutely required to explain the galactic dynamics.

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