

## The dark matter as an analogy to the epicycle

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**Abstract:** *The dark matter theory shares historical similarities with the ancient theory of epicycles. It is shown that a modified theory should be preferred over a search for the dark matter.*

**Keywords:** *dark matter, epicycle, modified theory, Newtonian mechanics*

It is about 400 years ago when Kepler's laws were discovered, and consequently the Newtonian theory of gravity was formulated. The distribution of mass density corresponds to a distribution of scalar potential through Poisson's equation. And the potential corresponds to a distribution of speeds through the virial theorem. And speeds are evaluated remotely by the Doppler shift in astronomical observations.

However, observed motions in space do not correspond to an observed distribution of the “visible” matter and to the Newtonian theory that was historically validated locally in the Solar System. Some cosmologists suggest a modification of the mass density distribution. It is called (interpreted) as the “dark matter”. However, it should be strictly named as a “missing mass” (or energy, angular momentum, etc.). By its introduction, we can obtain the observed distribution of speeds. However, we can obtain any distribution of speeds using a proper introduction of a “missing mass”. Thus, the “dark matter” can explain anything, and thus it is useless theory.

Very low concentration of possible “dark matter” (less than tenth of per mille) is present on the Earth (experimentally checked by measurements of the Newtonian constant). It is in a high contrast to the observational results of the cosmological theory where the “dark matter” dominates over the “visible” matter. It is surprising coincidence that we live in such dark-matter-clean environment. And also long term attempts to detect the dark matter experimentally are not successful. Note that experiment (than can be only local) can deal with the causality. However, observations are about a correlation only. The Newtonian mechanics was experimentally checked, while observational epicycles were not linked to any causality like astrology. Laws (and also modified laws) can be universalized. However, a distribution (or a modified distribution) cannot be universalized because the local dark matter concentration does not correspond to the remotely observed concentrations.

The existence of dark matter is an analogy to the epicycles. Epicycles were historically used as an approximation of observed motions. An arbitrary orbit (e.g. elliptical) can be approximated to an arbitrary precision by a sufficient number of epicycles (as well as the Fourier transform). However, these epicycles are circular orbits around points that do not contain a body. From the current physical point of view, there is a missing mass. However, the historically more successful are elliptic orbits and the Newtonian mechanics.

Occam's razor is used by some to favor the use of philosophically perfect circles and the dark matter rather than physical elliptic orbits and some modified law of gravitation, respectively. We need to look for a more complicated law (as in the case of the relativity theory) rather than use an observational best-fit approach that cannot be an argument for agreement with a theory. We must learn from history that the “law” should be modified, while the mass distribution (reality) should not. It clearly suggests that a new gravitational theory is needed.