A note on Quantization of Galactic Redshift and the Source-Sink model of Galaxies

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Abstract

This paper discusses shortly a Source-Sink model of galaxies and its implication to the observed quantization of galactic redshift. As shown elsewhere, the Newton law and Maxwell electromagnetic equations can be described by the Source-Sink model too. In this paper we shortly review the Source-Sink model of galaxies which can be interpreted further in the context of superfluid matter as described by Gross- Pitaevskii equation. And because it can be shown that radial Gross-Pitaevskii equation can yield ring soliton solutions, therefore we submit a conjecture that the universe may likely have a center in the form of ring soliton. This conjecture requires further observation in order to verify or refute.

Introduction

In recent years there are some reports suggesting explanations for quantization of galactic redshift as observed by Tifft et al. One of such a proposal is suggested by Firmin J. Oliveira, who submits a wave equation model based on Carmeli's Cosmological General Relativity in order to describe such a quantization of galactic redshift [1][2]. Despite its useful approach to describe this phenomenon of quantized redshift, Oliveira's approach apparently lacks a physical model to describe why there exists quantization of galactic redshift. Therefore we require a better approach which provides physical model of the phenomenon.

A Source-Sink model of Galaxies

Such a physical model of quantization of galactic redshift does exist, for example Hodge's Source-Sink Galaxies model. Hodge argues that on the galactic scale the universe is inhomogeneous and redshift z is occasionally less than zero. He also argues that several differences among galaxy types suggest that spiral galaxies are Sources and that early type, lenticular, and irregular galaxies are Sinks of a scalar potential field.[3]

Then Hodge postulates the existence of a scalar potential ρ (erg) field with the characteristics to cause the observed differences in spiral and elliptical galaxies. The gradient of ρ is proportional to a force F_s (dyne) that acts on matter. [3] The SPM suggests F_s exerts a force to repel matter from spiral galaxies and to attract matter to early type galaxies.

The SPM also suggests the photon is a particle. The derivation of Planck's black body radiation equation includes the proposition that the energy of a photon is discrete and composed of a number N of basic energy/particle packets.[3] From this conjecture, some formulas for redshift of sink and source galaxies can be derived.

While of course the arguments of Hodge can be discussed further, it seems interesting that he can come up with a physical model in order to explain such a quantization of galactic redshift.

Furthermore, it may be interesting to note here that both Newton law and Schrodinger equations can be derived from similar assumption of sink-source model.[4][5] In this regard, we can also note that Rahman has proven that classical electrodynamics can be derived from similar sink-source fluid model.[6]

While surely the aforementioned papers by Wang, Hodge and Rahman use different methods, all of them have the same conjecture that is an assumption of the existence of source-sink particles. Therefore this approach seems quite promising to explore further.

Gross-Pitaevskiian interpretation

Now we would like to extend further Hodge's sink-source model of galaxies into the context of Gross-Pitaevskii model. We know that Gross-Pitaevskii equation is often used to describe superfluidity. In one of his papers, Moffat has shown that quantum phion condensate model with Gross-Pitaevskii equation yields an approximate fit to data corresponding to CMB spectrum, and it also yields a modified Newtonian acceleration law which is in good agreement with galaxy rotation curve data.[7]

Furthermore, this author also has argued that Gross-Pitaevskii equations yields quantized vortice which can be used to explain the galactic intrinsic redshift phenomenon.[8]

Therefore here we also argue that Hodge's Source-Sink model of galaxies can be related to Gross-Pitaevskiian description of superfluidity.

In this regard, we would like to mention a recent paper by Toikka, Hietarinta, and Suominen [9], which suggests that there can be ring soliton-like solutions of the cylindrically symmetric (i.e. radial) Gross-Pitaevskii equation with a potential.

Extrapolating this result to the universe, we submit a conjecture that the universe may likely have a center in the form of ring soliton-like. This conjecture requires further observation in order to verify or refute.

Interestingly, one can also note that Michael Peck has also suggested that the Universe may have a center, using a revised model of General Relativity[10]. But of course it does not mean that we agree with all Peck's arguments.

Concluding Remarks

This paper discusses shortly a Source-Sink model of galaxies and its implication to the observed quantization of galactic redshift. As shown elsewhere, the Newton law and Maxwell electromagnetic equations can be described by the Source-Sink model too. In this paper we shortly review the Source-Sink model of galaxies which can be interpreted further in the context of superfluid matter as described by Gross- Pitaevskii equation. And because it can be shown that radial Gross-Pitaevskii equation can yield ring soliton solutions, therefore we submit a conjecture that the universe may likely have a center in the form of ring soliton-like. This conjecture requires further observation in order to verify or refute.

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