Research article Available online www.ijsrr.org ISSN: 2279-0543

International Journal of Scientific Research and Reviews

An Introduction to Dynamic Universe Model

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ABSTRACT:

This is solution for N-body problem without singularities and collisions using only Newtonian Physics. Here all bodies move and keep themselves in dynamic equilibrium with all other bodies depending on their present positions, velocities and masses. This model provides solution to problems, like Missing mass in Galaxies, Blue & red shifted Galaxies co-existence, Pioneer anomaly, New-horizons satellite trajectory calculations etc. Non collapsing large-scale mass structures formed when non-uniform density distributions of masses were used. This model explains the force behind expansion of universe and explains the large voids and non-uniform matter densities in universe. There are no Blackholes and Bigbang in this mathematical Model.

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INTRODUCTION:

Dynamic Universe Model is a totally non-general relativistic algorithm. Here in no way General Relativistic (GR) effects, are taken into consideration and this model doesn't reduce to GR on any condition. There is no space-time continuum. In this Dynamic Universe Model all the bodies in Universe are assumed to be dynamically moving.

This Dynamic Universe Model is a set of MATH equations for solving N-body problem. With SITA software it behaves like a hand held Calculator. SITA software in a PC will work like a Calculator for solving a typical N-body problem. Using the same set of equations one can give different initial values numerically to solve various different problems at different scales. These initial values (the Cartesian x, y, z positions and velocities & time step) are different for different applications. The distant Galaxies or distant local systems can be assumed as point masses with mass at their center of Gravity. That way the number of masses can be as low as 133 and otherwise this simulation can be done on higher number of masses also.

There are many secrets embedded in the Universe that are still unexplored. A simple uniform law may not explain all the peculiarities in the ever changing Dynamic universe. In fact, the uniform density is not observable at any scale because of large Voids and Great walls present in the Universe. Earth is not the center of universe. Our universe is finite. The view from earth is not being uniform in all the directions.

In this Dynamic Universe Model, bodies move in dynamic equilibrium to compensate for the continuous Gravitational attractions. Rotational Centrifugal forces are sufficient for compensating gravitational attraction forces. No additional repulsive forces like "Einstein's λ" are necessary. No symmetries were assumed. Our universe is not a Newtonian type static universe. Ours is not a contracting universe. It is an expanding universe with blue shifted galaxies present in it. It is not infinite but it is a closed finite universe. There are many images, sometimes more than one for each Galaxy. Our universe is neither isotropic nor homogeneous. It is LUMPY. But it is not empty. It may not hold an infinite sink at the infinity to hold all the energy that is escaped. This is closed universe and no energy will go out of it. Ours is not a steady state universe in the sense, it does not require matter generation through empty spaces. No starting point of time is required. Time and spatial coordinates

can be chosen as required. No imaginary time, perpendicular to normal time axis, is required. No baby universes, black holes or warm holes were built in.

Earlier authors like Chandrasekhar[3] developed energy tensor. Dynamic Universe Model uses Virial theorem and uses a new type of tensor mathematics without any differential equations for solving an age old N-body problem. This new method developed has its application into cosmological problems also. The co-existence of Blue shifted Galaxies is one of such an application.

There is a fundamental difference between 'galaxies / systems of galaxies' and 'systems that normally use statistical mechanics', such as molecules in a box. The molecules *repel* each other. However, in gravitation we have not yet experienced any repulsive forces. (See for ref: Binny and Tremaine (1987))[1]. Only attraction forces were seen. Einstein introduced cosmological constant λ to introduce repulsive forces at large scales like inter galactic distances in his General relativity based cosmological considerations in for expanding universe (1917)[2]. Many people did not like λ, and this λ created turbulence in the scientific world. One of the reasons for his cosmological constant λ is that he disliked the picture at infinity given by Newtonian gravitation. Though his ideas were good, the path chosen by him was rough and turbulent. Almost every worker faced / scientist in this field either faced problems conceptually or mathematically with Bigbang based cosmologies. Singularities were big hurdles for many of us.

This Dynamic Universe Model can be used not only for cosmological models, but also for exact prediction of trajectories of satellites by considering gravitation effects of various Planets and moons in solar system.

MATHEMATICAL BACKGROUND:

Let us assume an inhomogeneous and anisotropic set of N point masses moving under mutual gravitation as a system and these point masses are also under the gravitational influence of other additional systems with a different number of point masses in these different additional systems. For a broader perspective see the author's work[3], let us call this set of all the systems of point masses as an Ensemble. Let us further assume that there are many Ensembles each consisting of a different number of systems with different number of point masses. Similarly, let us further call a group of Ensembles

as Aggregate. Let us further define a Conglomeration as a set of Aggregates and let a further higher system have a number of conglomerations and so on and so forth.

Initially, let us assume a set of N mutually gravitating point masses in a system under Newtonian Gravitation. Let the α^{th}point mass has mass m_α, and is in position x_α. In addition to the mutual gravitational force, there exists an external ϕ_{ext}, due to other systems, ensembles, aggregates, and conglomerations etc., which also influence the total force F_α acting on the point mass α. In this case, the ϕ_{ext} is not a constant universal Gravitational field but it is the total vectorial sum of fields at $x_\alpha$due to all the external to its system bodies and with that configuration at that moment of time, external to its system of N point masses.

Total Mass of system = $$M = \sum_{\alpha=1}^{N} m_\alpha \qquad (1)$$

Total force on the point massα is Fα , Let $F_{\alpha\beta}$ is the gravitational force on the α^{th}point mass due to β^{th}point mass.

$$F_\alpha = \sum_{\substack{\alpha=1 \\ \alpha\neq\beta}}^{N} F_{\alpha\beta} - m_\alpha \nabla_\alpha \Phi_{ext}(\alpha) \qquad (2)$$

Moment of inertia tensor

Consider a system of N point masses with mass m_α, at positions X_α, α=1, 2,…N; The moment of inertia tensor is in external back ground field ϕ_{ext}.

$$I_{jk} = \sum_{\alpha=1}^{N} m_\alpha x_j^\alpha x_k^\alpha \qquad (3)$$

Its second derivative is

$$\frac{d^2 I_{jk}}{dt^2} = \sum_{\alpha=1}^{N} m_\alpha \left(\overset{\circ\circ}{x}{}_j^\alpha x_k^\alpha + \overset{\circ}{x}{}_j^\alpha \overset{\circ}{x}{}_k^\alpha + x_j^\alpha \overset{\circ\circ}{x}{}_k^\alpha \right) \qquad (4)$$

The total force acting on the point massα is and $\hat{F}$ is the unit vector of force at that place of that component.

$$F_j^\alpha = m_\alpha \overset{\circ\circ}{x}{}_j^\alpha = \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} \frac{G m_\alpha m_\beta \left(x_j^\beta - x_j^\alpha \right) \hat{F}}{\left| x^\beta - x^\alpha \right|^3} - \nabla \Phi_{ext,j} m_\alpha \qquad (5)$$

Writing a similar formula for F^{α}_{k}

$$F_k^{\alpha} = m_{\alpha}\,\overset{\circ\circ}{x}{}_k^{\alpha} = \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} \frac{Gm_{\alpha}m_{\beta}\left(x_k^{\beta}-x_k^{\alpha}\right)\hat{F}}{\left|x^{\beta}-x^{\alpha}\right|^3} - \nabla\Phi_{ext,k}m_{\alpha} \tag{6}$$

$$\overset{\circ\circ}{x}{}_j^{\alpha} = \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} \frac{Gm_{\beta}\left(x_j^{\beta}-x_j^{\alpha}\right)\hat{F}}{\left|x^{\beta}-x^{\alpha}\right|^3} - \nabla\Phi_{ext}$$

OR => (7)

$$\overset{\circ\circ}{x}{}_k^{\alpha} = \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} \frac{Gm_{\beta}\left(x_k^{\beta}-x_k^{\alpha}\right)}{\left|x^{\beta}-x^{\alpha}\right|^3} - \nabla\Phi_{ext}$$

And => (8)

Lets define Energy tensor (in the external field ϕ_{ext})

$$\frac{d^2I_{jk}}{dt^2} = 2\sum_{\alpha=1}^{N} m_{\alpha}\left(\,\overset{\circ}{x}{}_j^{\alpha}\,\overset{\circ}{x}{}_k^{\alpha}\,\right) + \sum_{\substack{\alpha=1 \\ \alpha\neq\beta}}^{N}\sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} \frac{Gm_{\alpha}m_{\beta}\left\{\left(x_k^{\beta}-x_k^{\alpha}\right)x_j^{\alpha}+\left(x_j^{\beta}-x_j^{\alpha}\right)x_k^{\alpha}\right\}}{\left|x^{\beta}-x^{\alpha}\right|^3}$$

$$-\sum_{\alpha=1}^{N}\nabla\Phi_{ext}m_{\alpha}x_j^{\alpha} - \sum_{\alpha=1}^{N}\nabla\Phi_{ext}m_{\alpha}x_k^{\alpha} \tag{9}$$

Lets denote Potential energy tensor = Wjk =

$$\sum_{\substack{\alpha=1 \\ \alpha\neq\beta}}^{N}\sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} \frac{Gm_{\alpha}m_{\beta}\left\{\left(x_k^{\beta}-x_k^{\alpha}\right)x_j^{\alpha}+\left(x_j^{\beta}-x_j^{\alpha}\right)x_k^{\alpha}\right\}}{\left|x^{\beta}-x^{\alpha}\right|^3} \tag{10}$$

Lets denote Kinetic energy tensor = 2 K_{jk} = $2\sum_{\alpha=1}^{N} m_{\alpha}\left(\,\overset{\circ}{x}{}_j^{\alpha}\,\overset{\circ}{x}{}_k^{\alpha}\,\right)$ (11)

Lets denote External potential energy tensor = 2 Φ_{jk}

$$= \sum_{\alpha=1}^{N}\nabla\Phi_{ext}m_{\alpha}x_j^{\alpha} + \sum_{\alpha=1}^{N}\nabla\Phi_{ext}m_{\alpha}x_k^{\alpha} \tag{12}$$

Hence $$\frac{d^2I_{jk}}{dt^2} = W_{jk} + 2K_{jk} - 2\Phi_{jk} \tag{13}$$

Here in this case

$$F(\alpha) = \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} F_{\alpha\beta} - \nabla_\alpha \Phi_{ext}(\alpha) m_\alpha$$

$$= \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} \frac{G m_\alpha m_\beta \left(x^\beta - x^\alpha\right)}{\left|x^\beta - x^\alpha\right|^3} - \nabla\Phi_{ext} m_\alpha \qquad (14)$$

$$= \left\{ \overset{\circ\circ}{x}{}^{\alpha} (\text{int}) - \nabla_\alpha \Phi_{ext}(\alpha) \right\} m_\alpha \qquad (15)$$

$$\overset{\circ\circ}{x}(\alpha) = \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} \frac{G m_\beta \left(x^\beta - x^\alpha\right)}{\left|x^\beta - x^\alpha\right|^3} - \nabla\Phi_{ext} \qquad (16)$$

We know that the total force at $x(\alpha) = F_{tot}(\alpha) = -\nabla_\alpha \Phi_{tot}(\alpha) m_\alpha$

Total PE at $\alpha = m_\alpha \Phi_{tot}(\alpha) = -\int F_{tot}(\alpha) dx$

$$= -\int \left\{ \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} \overset{\circ\circ}{x}{}^{\alpha}_{\text{int}} m_\alpha - \nabla_\alpha \Phi_{ext}(\alpha) m_\alpha - \right\} dx$$

$$= \int \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} \frac{G m_\beta m_\alpha \left(x^\beta - x^\alpha\right)}{\left|x^\beta - x^\alpha\right|^3} dx - \int \nabla\Phi_{ext} m_\alpha dx \qquad (17)$$

Therefore total Gravitational potential $\phi_{tot}(\alpha)$ at x (α) per unit mass

$$\Phi_{tot}(\alpha) = \Phi_{ext} - \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N} \frac{G m_\beta}{\left|x^\beta - x^\alpha\right|} \qquad (18\text{-s})$$

Lets discuss the properties of ϕ_{ext} :-

ϕ_{ext} can be subdivided into 3 parts mainly

ϕ_{ext} due to higher level system, ϕ_{ext} -due to lower level system, ϕ_{ext} due to present level. [Level : when we are considering point mass in the same system (Galaxy) it is same level, higher level is cluster of galaxies, and lower level is planets & asteroids].

ϕ_{ext} due to lower levels : If the lower level is existing, at the lower level of the system under consideration, then its own level was considered by system equations. If this lower level exists

anywhere outside of the system, center of (mass) gravity outside systems (Galaxies) will act as unit its own internal lower level practically will be considered into calculations. Hence consideration of any lower level is not necessary.

SYSTEM – ENSEMBLE:

Until now we have considered the system level equations and the meaning of $\phi_{ext.}$ Now let's consider an ENSEMBLE of system consisting of N_1, N_2 … Nj point masses in each. These systems are moving in the ensemble due to mutual gravitation between them. For example, each system is a Galaxy, and then ensemble represents a local group. Suppose number of Galaxies is j, Galaxies are systems with point masss N1, N2 ….NJ, we will consider ϕ_{ext} as discussed above. That is we will consider the effect of only higher level system like external Galaxies as a whole, or external local groups as a whole.

Ensemble Equations (Ensemble consists of many systems)

$$\frac{d^2 I^{\gamma}{}_{jk}}{dt^2} = W^{\gamma}_{jk} + 2K^{\gamma}_{jk} - 2\Phi^{\gamma}_{jk} \qquad (18\text{-E})$$

Here $^{\gamma}$ denotes Ensemble.

This $\Phi^{\gamma}jk$ is the external field produced at system level. And for system

$$\frac{d^2 I_{jk}}{dt^2} = W_{jk} + 2K_{jk} - 2\Phi_{jk} \qquad (13)$$

Assume ensemble in a isolated place. Gravitational potential $\phi_{ext}(\alpha)$produced at system level is produced by Ensemble and $\phi^{\gamma}{}_{ext}(\alpha) = 0$ as ensemble is in a isolated place.

$$\Phi^{\gamma}_{tot}(\alpha) = \Phi^{\gamma}_{ext} - \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N^{\gamma}} \frac{Gm^{\gamma}_{\beta}}{\left| x^{\gamma\beta} - x^{\gamma\alpha} \right|} \qquad (19)$$

There fore

$$\Phi^{\gamma}_{tot} = \Phi_{ext}(\alpha) = -\sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N^{\gamma}} \frac{Gm^{\gamma}_{\beta}}{\left| x^{\gamma\beta} - x^{\gamma\alpha} \right|} \qquad (20)$$

And $$2\Phi_{jk} = -\frac{d^2 I_{jk}}{dt^2} + W_{jk} + 2K_{jk} \qquad (13)$$

$$= \sum_{\alpha=1}^{N} \nabla\Phi_{ext} m_\alpha x_j^\alpha + \sum_{\alpha=1}^{N} \nabla\Phi_{ext} m_\alpha x_k^\alpha \qquad (21)$$

AGGREGATE Equations(Aggregate consists of many Ensembles)

$$\frac{d^2 I_{jk}^{\delta\gamma}}{dt^2} = W_{jk}^{\delta\gamma} + 2K_{jk}^{\delta\gamma} - 2\Phi_{jk}^{\delta\gamma} \qquad (18\text{-A})$$

Here $^{\delta}$ denotes Aggregate.

This $\Phi^{\delta\gamma}$jk is the external field produced at Ensemble level. And for Ensemble

$$\frac{d^2 I^{\gamma}{}_{jk}}{dt^2} = W_{jk}^{\gamma} + 2K_{jk}^{\gamma} - 2\Phi_{jk}^{\gamma} \qquad (18\text{-E})$$

Assume Aggregate in an isolated place. Gravitational potential ϕ_{ext} (α) produced at Ensemble level is produced by Aggregate and $\phi^{\delta\gamma}{}_{ext}(\alpha) = 0$ as Aggregate is in a isolated place.

$$\Phi_{tot}^{\delta\gamma}(\alpha) = \Phi_{ext}^{\delta\gamma} - \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N^{\delta\gamma}} \frac{Gm_\beta^{\delta\gamma}}{\left| x^{\delta\gamma\beta} - x^{\delta\gamma\alpha} \right|} \qquad (22)$$

$$\Phi_{tot}^{\delta\gamma}(\text{Aggregate}) = \Phi_{ext}^{\gamma}(\alpha)(\text{Ensemble}) = -\sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N^{\delta\gamma}} \frac{Gm_\beta^{\delta\gamma}}{\left| x^{\delta\gamma\beta} - x^{\delta\gamma\alpha} \right|}$$

Therefore (23)

And $$\Phi_{jk}^{\gamma} = \sum_{\alpha=1}^{N^{\gamma}} \nabla\Phi_{ext}^{\delta} m_\alpha x_j^{\delta\alpha} + \sum_{\alpha=1}^{N} \nabla\Phi_{ext}^{\delta} m_\alpha x_k^{\delta\alpha} \qquad (24)$$

Total AGGREGATE Equations :(Aggregate consists of many Ensembles and systems)

Assuming these forces are conservative, we can find the resultant force by adding separate forces vectorially from equations (20) and (23).

$$\Phi_{ext}(\alpha) = -\sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N^{\gamma}} \frac{Gm_{\beta}^{\gamma}}{\left|x^{\gamma\beta} - x^{\gamma\alpha}\right|} - \sum_{\substack{\beta=1 \\ \alpha\neq\beta}}^{N^{\delta\gamma}} \frac{Gm_{\beta}^{\delta\gamma}}{\left|x^{\delta\gamma\beta} - x^{\delta\gamma\alpha}\right|} \quad (25)$$

This concept can be extended to still higher levels in a similar way.

Corollary 1:

$$\frac{d^2 I_{jk}}{dt^2} = W_{jk} + 2K_{jk} - 2\Phi_{jk} \quad (13)$$

The above equation becomes scalar Virial theorem in the absence of external field, that is ϕ=0 and in steady state,

i.e. $$\frac{d^2 I_{jk}}{dt^2} = 0 \quad (27)$$

$$2K + W = 0 \quad (28)$$

But when the N-bodies are moving under the influence of mutual gravitation without external field then only the above equation (28) is applicable.

Corollary 2:

Ensemble achieved a steady state,

i.e. $$\frac{d^2 I_{jk}^{\gamma}}{dt^2} = 0 \quad (29)$$

$$W_{jk}^{\gamma} + 2K_{jk}^{\gamma} = 2\Phi_{jk}^{\gamma} \quad (30)$$

This Φjk external field produced at system level. Ensemble achieved a steady state; means system also reached steady state.

i.e. $$\frac{d^2 I_{jk}}{dt^2} = 0 \quad (27)$$

$$W_{jk} + 2K_{jk} = 2\Phi_{jk}^{\gamma} \quad (31)$$

The Equation 25 is the main powerful equation, which gives many results that are not possible otherwise today. This tensor can be subdivided into 21000 small equations without any differential equations or integral equations. Hence, this set up gives a unique solution of Cartesian X, Y, Z components of coordinates, velocities and accelerations of each point mass in the setup for that particular instant of time. A point to be noted here is that the Dynamic Universe Model never reduces to General relativity on any condition. It uses a different type of mathematics based on Newtonian physics. This mathematics used here is simple and straightforward. All the mathematics and the Excel based software details are explained in the three books published by the author[14, 15, 16] In the first book, the solution to N-body problem-called Dynamic Universe Model (SITA) is presented; which is singularity-free, inter-body collision free and dynamically stable. This is the Basic Theory of Dynamic Universe Model published in 2010 [14]. The second book in the series describes the SITA software in EXCEL emphasizing the singularity free portions. It explains more than 21,000 different equations (2011)[15]. The third book describes the SITA software in EXCEL in the accompanying CD / DVD emphasizing mainly HANDS ON usage of a simplified version in an easy way. The third book contains explanation for 3000 equations instead of earlier 21000 (2011)[16].

INITIAL CONDITIONS FOR DYNAMIC UNIVERSE MODEL

Now lets discuss supporting observations for initial conditions based on Anisotropy and heterogeneity of Universe:

Our galaxy the Milky way is moving with a speed 454 ± 125 km/sec towards l=63° ± 15° and b=-11° ± 14°relative to distant part of samples and 474 ± 164 km/sec towards l=167° ± 20° and b=5° ± 20°relative to nearer part of samples. (JV.Narlikar, (1983)[4]). The local group comprising of Milky way, NGC6822, Andromida galaxy and other dwarf elliptical galaxies, Magellanic clouds rotate about their centers and revolve around a common center. S.M.Faber and David Burstain (1988)[5] described the STREEMING motions towards the Great Attractor (located at l =309° and b=+18°) by the local group, Virgo cluster, Ursa major, Centaurus, Camelopardalis, Perseus-Pisces etc ., clusters with speeds ranging up to 1000km/sec. Please notice the difference in directions of movement as well as speeds. All these clusters form a super cluster which also rotate and revolve about each other. Groups of super clusters form Filament structures and to grate walls and so on. This is how our universe is lumpy and anisotropic even at large scale.

Another piece of supporting evidence for the Dynamic Universe Model is here. There is a considerable discussion, as to whether GA: the Great attractor exists at all. For example D.A. Mathewson, V.L. Ford, and M. Buckhorn[6] have measured the peculiar velocities 1355 spiral Galaxies. They find no backside in fall into GA region, rather a bulk flow of about 400 km/sec on the scales of 100 ho-1 MPC. Thus there is a considerable doubt about the existing of an attracting mass there. Both the parties find streaming motions or bulk flow. If there is no attracting mass, then why they are moving? This super cluster must be in revolution motion.

Birch (1982)[7], has discovered the asymmetric distribution of the angles of rotation of polarization vectors of 132 radio sources and tried to explain this via the Global rotation. We think that the asymmetric distribution of the angles of rotation of polarization vectors, is due to the galaxies or parts of clusters revolving in different directions.

Our universe is not having a uniform mass distribution. Isotropy & homogeneity in mass distribution is not observable at any scale. We can see present day observations in '2dFGRS survey' publications for detailed surveys especially by Colless et al in MNRAS (2001)[8] for their famous DTFE mappings, where we can see the density variations and large-scale structures. The universe is lumpy as you can see in the picture given here in Wikipedia.

The universe is lumpy as you can see the voids and structures in the picture given by Fairall et al (1990)[9] and in Wikipedia for a better picture. WMAP also detected cold spot see the report given by Cruz et al (2005)[10]. They say '*A cold spot at (b = -57, l = 209) is found to be the source of this non-Gaussian signature' which* is approximately 5 degree radius and 500 million light years. This is closely related with Lawrence Rudnick et al's (2007)[11] work, which says that there are no radio sources even in a larger area, centered with WMAP cold spot. It is generally known as 'Great void', which is of the order of 1 billion light years wide; where nothing is seen. They saw*..." little or no radio sources in a volume that is about 280 mega-parsecs or nearly a billion light years in diameter. The lack of radio sources means that there are no galaxies or clusters in that volume, and the fact that the CMB is cold there suggests the region lacks dark matter, too. There are other big voids also upto 80 mpc found earlier which are optical."*

There is the Sloan Great Wall, the largest known structure, a giant wall of galaxies as given by J. R. Gott III et al., (2005)[12] 'Logarithmic Maps of the Universe'. They say "*The wall measures 1.37 billion light years in length and is located approximately one billion light-years from Earth….The Sloan Great Wall is nearly three times longer than the Great Wall of galaxies, the previous record-holder".*

. Hence such types of observations indicate that our Universe is lumpy. After seeing all these we can say that uniform density as prevalent in Bigbang based cosmologies is not a valid assumption. Hence, in this paper we have taken the mass of moon as moon & Galaxy as Galaxy employing non uniform mass densities.

We can use Galactic dynamics say up to 30kpc (radius of the Milky-way) without any problem. But just after 30kpc General relativity comes into picture. Why? We are using Galactic dynamics for finding out missing mass of the universe as required for General relativity, without using General relativistic effects. Everybody accepts this. But if it is a nearby galaxy named NGC6822, which is at a center-to-center distance of 48kpc from Milkyway, then General relativity comes into picture. We have to use some General relativistic models like Friedmann-Robertson-Walker[13] model, why? Just after the boundaries of Milkyway? Why can't we use Galactic dynamic models and equations extended further to inter galactic forces also?

Here in this model the present measured CMB is from stars, galaxies and other astronomical bodies. We know that the CMB isotropy is not entirely due to Galaxies. Nevertheless, there are other factors also. The stars and other astronomical bodies also contribute for CMB. Moreover, factors like Scattering of rays done by ISM and sidelobe gains & backlobe gains of Microwave dish antenna cannot be excluded they are not less. There are CMB cold spots, where nothing is seen. Observed anisotropies of CMB are in the order of 1 to 20 in million, whereas the anisotropies of in large scale structures are coming up to 7% in the observational scales.

RESULTS:

This Dynamic Universe Model approach solves many unsolved problems. In this proposal I want to submit the Following paper subjects for Dynamic Universe Model. Only differences used between the various simulations are in the initial values & the time steps. The structure of masses is different. In the first 2 cases, approximate values of masses and distances were used. In the third and fourth case, real

values of masses and distances for a close approximation were used. Some of the output graphs or output tables for some select results are shown with a brief explanation further below in this section.

1. Galaxy Disk formation using Dynamic Universe Model (Dense mass) Equations
2. Solution to Missing mass in Galaxies: It proves that there is no missing mass in Galaxy due to circular velocity curves No Dark matter is required + Poster presented in (COSPAR12)
3. Withstands 10^5 (One Hundred Thousand) times the Normal Jeans[5] swindle test
4. Blue shifted and red shifted Galaxies co-existence… Explaining the Existence of large number of blue shifted Galaxies, Prediction of Blue shifted Galaxies, initial values you can see in the paper DSR894, Submitted in 2004[1].
5. Explains gravity disturbances like Pioneer anomaly.
6. Proving Dynamic Universe Model is singularity free and collision free in the first book 'Dynamic Universe Model: A singularity-free N-body problem solution [ISBN 978-3-639-29436-1]'
7. New revised paper on Dynamic universe model for co-existence red and blue shifted Galaxies in the Universe , Showing quasars are blue shifted Galaxies
8. Predicts the trajectory of New Horizons satellite and its trajectory initial values can be seen Book 'Dynamic Universe Model: A singularity-free N-body problem solution [ISBN 978-3-639-29436-1] (COSPAR 12).'
9. Working software file containing full set of all 21000 equations in EXCEL. All these equations are explained in Book 2
10. Effect of Universal Gravitational Force on Radio photon explains Very Long Baseline Interferometry Observations (COSPAR 12)

RESULT 1: GALAXY DISK FORMATION

In this experiment, point masses were kept in Cartesian three-dimensional random positions as shown in Fig 1. They were allowed to move under their own gravitation. They form a disk shape as shown in Fig 2.

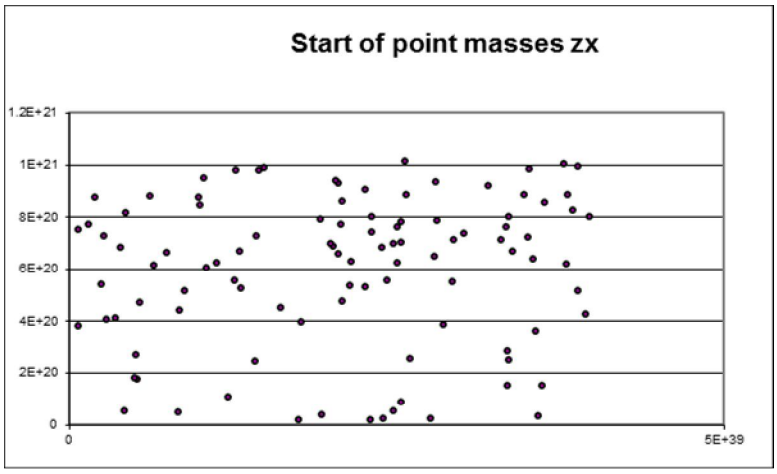


Figure 1

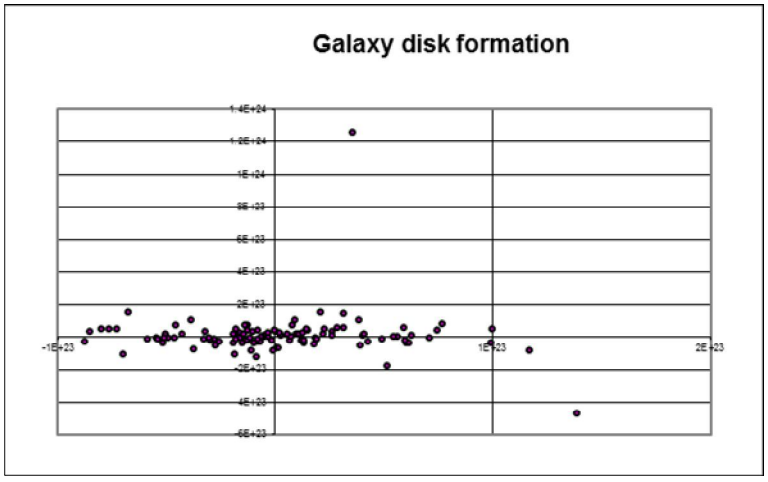


Figure 2

RESULT 2: MISSING MASS IN GALAXIES:

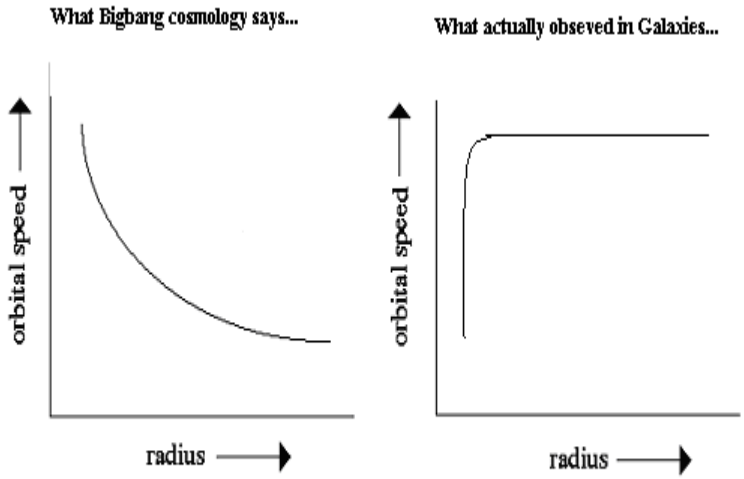
Now for the second result, SITA simulations for Dynamic Universe Model were used to find out theoretical star circular velocity curves in a Galaxy (star circular velocity verses star distance from the center of galaxy). There is a usual conceptual mistake: Newtonian Gravitation or Einstein's General theory of Relativity treated the Multi-body dynamical problem as a single body static problem.

In Bigbang cosmologies, theoretical star circular velocities in a Galaxy are predicted as shown in the left of Pic 1. The observed rotation curves are shown on the right side of same picture. They use spectroscopic 21-cm maps of neutral hydrogen for finding the rotation curve of the Galaxy, which stays

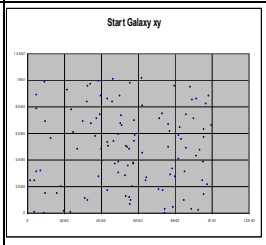
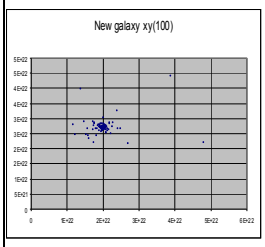
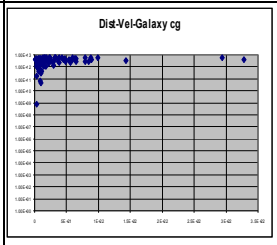
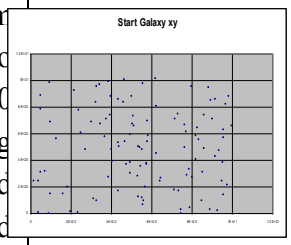
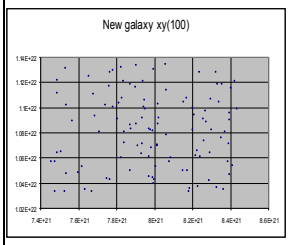
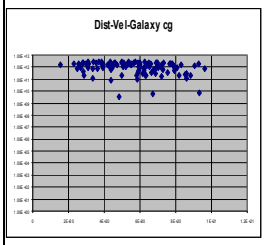
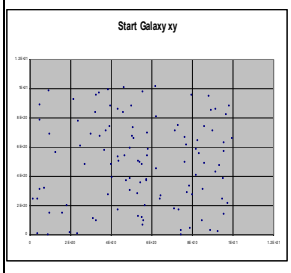
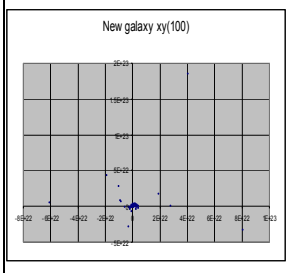
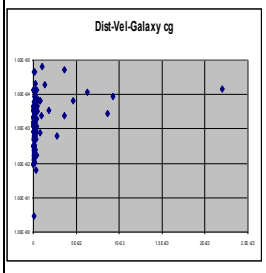
flat out to large distances, instead of falling off as in the Pic 1. Does this mean that the mass of the Galaxy increases with increasing distance from the center, as said by Bigbang?

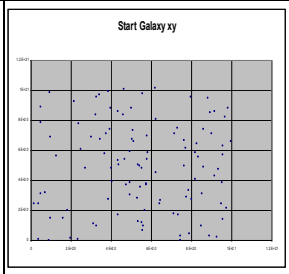
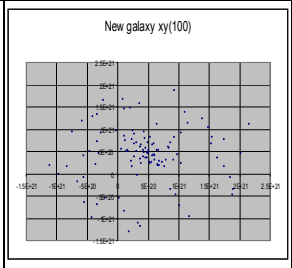
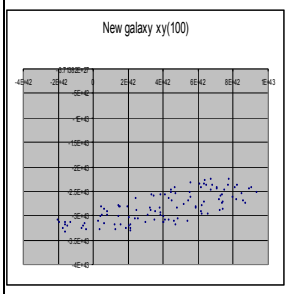
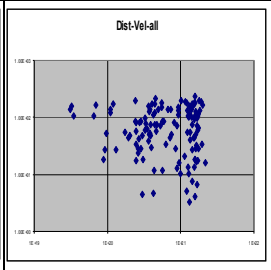
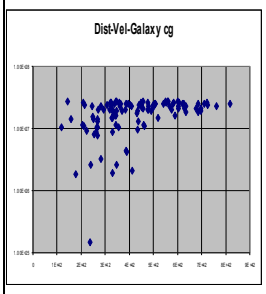
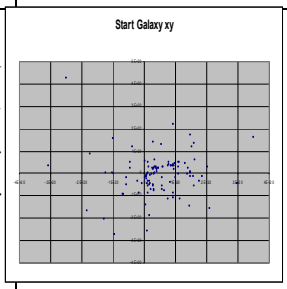
No, Dynamic universe Model explains this phenomenon. Because of the dynamism of the point masses (stars) after some radial distance from the centre of the Galaxy under observation, appear to have achieved some higher velocities, when there is gravitational effect of huge (self) Galaxy center-mass called *densemass* and the gravitational effect of external Galaxies acting on the stars, when both gravitational effects are simultaneously present. This condition is clearly indicated in the fallowing graph table below.

Pic 1 Missing Mass in Galaxies: The theoretical star circular velocities in a Galaxy are predicted as shown in the left of Pic 1. The observed rotation curves are shown on the right side of same picture.



Pic1: Rotation Curve of the Galaxy

Graph Table : Theoretical Galaxy Circular Vel vs radius Graphs in different cases with start end of 100 iterations positions				
	Case	Starting positions	End of 100 iterations	Velocity vs Gal Radius
1	Case 1 : From starting positions to positions after 100 iterations showing disk formation and velocities achieved graph. This is with a *Huge central mass at the center of galaxy, sun like stars and external galaxies xy,* zx position graphs.			
2	Case 2 : From starting positions to positions after 100 iterations showing disk formation and velocities achieved graph. This is *without a Huge central mass at the center* of galaxy, sun like stars and external galaxies xy, zx position graphs.			
3	**Case 3 : From starting positions to positions after 100 iterations showing disk formation and velocities achieved graph. This is *wih a***			

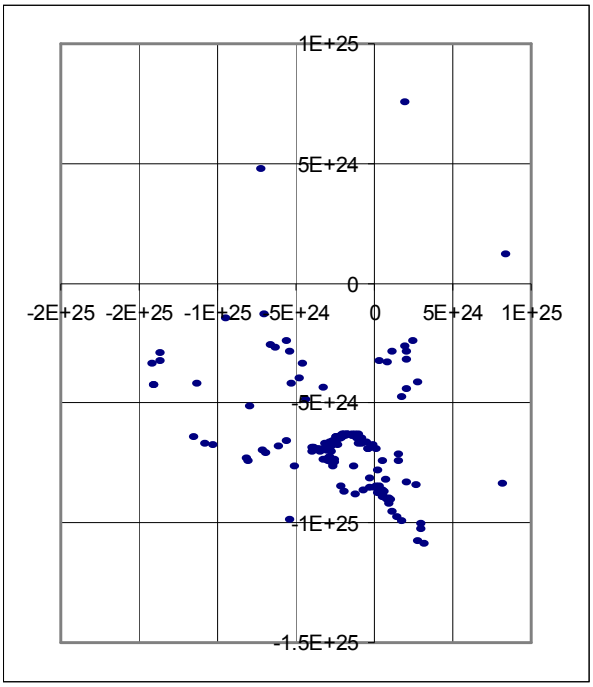
	***Huge central mass at the center* of galaxy, sun like stars and *no external galaxies* xy, zx position graphs.**			
4	Case 4: From starting positions to positions after 100 iterations showing *no* disk formation and velocities achieved graph. This is *wihout a Huge central mass at the center* of galaxy, sun like stars and *no external galaxies* xy, zx position graphs.		 	 
5	Case 5: Theoretical star circular velocity curves in a Galaxy (star circular velocity verses star distance from the center of galaxy) in gravitationally stabilized system of masses after forming a galaxy disk when it's stability analysis was done by giving perturbations and jeans swindle test			

Graph Table: **Missing Mass in Galaxies**: In Cases 1,2,3 & 4 show cases with and without central mass and / or external galaxies. We can see clearly external Galaxies and Central mass in Galaxy is

required as dist velocity curves are near to actual observational results. These N-body calculations and results are showing theoretical star circular velocity curves. Do the Galaxies have to be assumed to have some missing mass? Is that required**?**

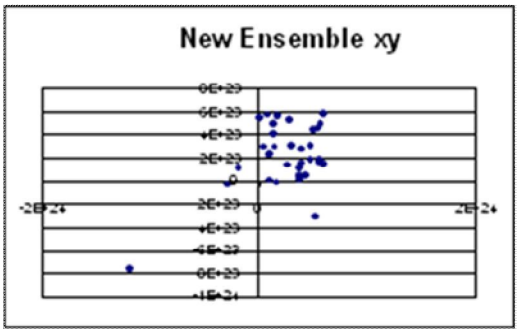
RESULT 4: BLUE SHIFTED AND RED SHIFTED GALAXIES CO-EXISTENCE (2004)

In this dynamic universe model – Galaxies in a cluster are rotating and revolving. Depending on the position of observer's position relative to the set of galaxies. Some may appear to move away, and some may appear to come near. The observer may also be residing in a solar system, revolving around the center of Milky Way in a local group. He is observing the galaxies outside. Many times he can observe only the coming near or going away component of the light ray called Hubble components. The other direction cosines of the movement may not be possible to measure exactly in many cases.



Graph G8 represent the positions of all masses in this simulation, after four time-steps and seven time-steps. We can see the formation of some three-dimensional circles clearly.

RESULT 7: BLUE SHIFTED AND RED SHIFTED GALAXIES CO-EXISTENCE (2012)



Here in this example (in this new simulation), in the above figure, graphs was with the name New Ensemble xy. The ZX plots of positions of Globular Clusters and Galaxies approximately have the mass of about 100 million to a billion or 10^{12} solar masses. All these are point masses for Galaxies of normal sizes. The word 'new' in the name is an indicative word for the result of that particular iteration in the simulation. The first iteration is the starting positions of the Galaxies in xy or zx plots. From that with a time step of 3.15576E+16 seconds or one billion years is allowed for the free fall of all the Galaxies. Next set of positions is shown in the iteration 1. After that is iteration 2 and so on. One can see the rotations of these masses. In addition, the marked change of positions from iteration to iteration when we look through the series of graphs.

In the particular graph shown above started from random positions in the beginning, now shows circle formations and movement. This graph indicate all Galaxies are rotating about. This graph show to the observer, some Galaxies are coming near and some are going away. Hence these galaxies are either red shifted or blue shifted.

RESULT 8: TRAJECTORY OF NEW HORIZONS SATELLITE

In this paper the effect of Universal Gravitational Force is calculated on New Horizons Satellite, by using a singularity free and collision free N-body problem solution called Dynamic Universe Model. New Horizons is NASA's artificial satellite now going towards to the dwarf planet Pluto. It has crossed Jupiter. It is expected to be the first spacecraft to go near and study Pluto and its moons, Charon, Nix, and Hydra. These are the predictions for New Horizons (NH) space craft as on A.D. 2009-Aug-09 00:00:00.0000 hrs. The behavior of NH is similar to Pioneer Space craft as NH traveling is alike to Pioneer. NH is supposed to reach Pluto in 2015 AD. There was a gravity assist taken at Jupiter about a year back. Exact details can be found at ref 22 [22]. As Dynamic universe model explains Pioneer

anomaly and the higher gravitational attraction forces experienced towards SUN, It can explain NH also in a similar fashion.

Table 1: SITA Calculation sample OUTPUTS for NH(1st row): after 220 iterations with 24hrs Time-step

Mass No.	u x (b1) velocity x m/sec	u y (b2) velocity y m/sec	u z (b3) velocity z m/sec	s x (a1) Position x meters	Sy (a2) Position y meters	Sz (a3) Position z meters
1	5910.475287	-15727.84869	602.0358627	1.31442E+11	-2.10854E+12	60123860323
2	1515.491698	-31300.09708	-2695.918095	-1.08644E+11	-62585674556	4859539426
3	-1828.169074	31741.76598	540.3752709	1.27107E+11	9429186696	-7205348169
4	21967.05386	17694.02539	-0.7613474	1.07025E+11	-1.22802E+11	3983952.514
5	-15140.39422	20071.13526	792.4411952	1.61332E+11	1.51712E+11	-782015907.2
6	7997.051973	10844.24963	-223.9644393	5.90358E+11	-4.69402E+11	-11262026007
7	-1603.042402	-9612.751852	230.898668	-1.40105E+12	1.58683E+11	52994601955
8	661.9794762	6461.3927	15.46063671	2.99041E+12	-3.09864E+11	-39882635995
9	3101.241258	4483.443198	-163.7665483	3.67452E+12	-2.58398E+12	-31471133568
10	5556.287859	-819.2750731	-1509.729058	1.74961E+11	-4.71521E+12	4.54158E+11
11	22681.82274	16251.78272	18.70934883	1.04161E+11	-1.30332E+11	-135710382.3

12	2.209718569	-3.110434811	-0.033286597	17900665.41	-28360265.62	-205941.1773
13	-0.002464296	0.000158851	-0.001357868	-3.07379E+16	-2.48085E+16	5.99014E+15
14	-0.051559836	-0.032426184	-0.023584373	-1.70141E+16	-4.49612E+13	3.79378E+16
15	0.039925529	0.028281984	0.017840304	-1.71774E+16	-1.53305E+14	3.78638E+16
16	-0.002468035	0.000155086	-0.001369146	-1.85801E+15	1.6393E+15	-5.61485E+16
17	-0.002470093	0.000156481	-0.001368848	9.02924E+15	-7.13182E+15	-7.77879E+16

RESULT 10: VLBI

Large variation in the Gravitational bending results of VLBI:

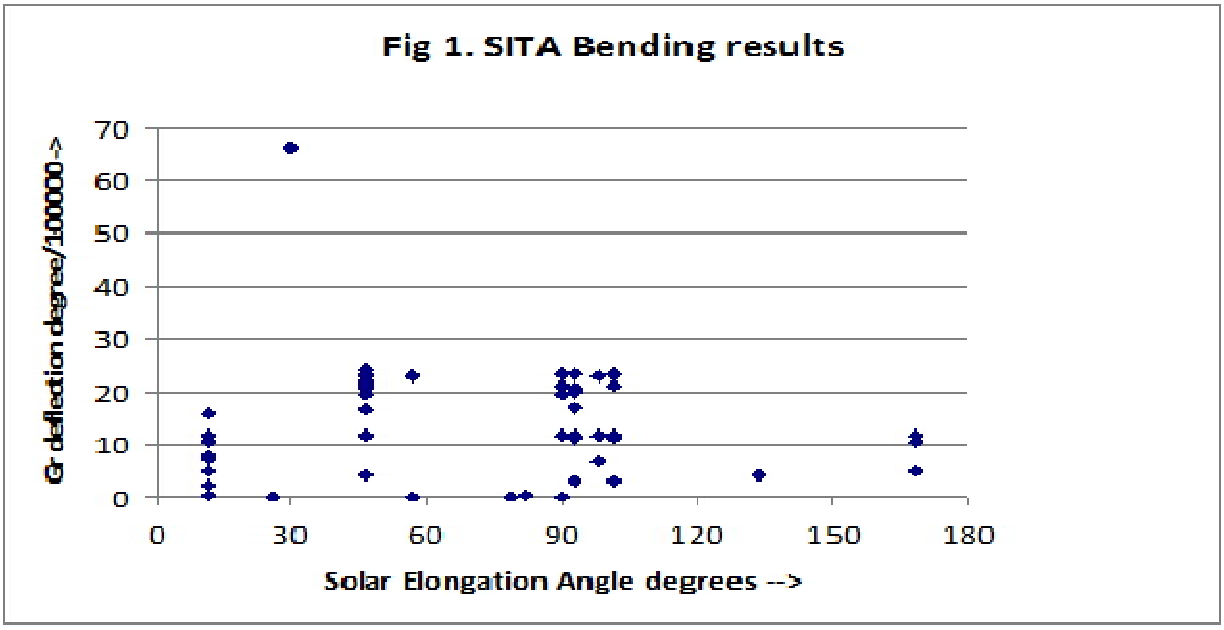
- Very long baseline interferometry (VLBI) , in the field of Radio astronomical observations of quasars, Galaxies etc
- This variation is clearly visible when the solar gravitational bending / deflection angle is plotted against Solar Elongation angle.

Here the capabilities of this Dynamic Universe Model are extended into micro world i.e. to light photons and Radio wavelength photons and Neutrinos etc. By doing so a real world Very long baseline interferometry (VLBI) observations are explained. The present day Physics considers gravitation effects of only the main gravitating body, whereas Dynamic Universe Model considers the Gravitational effect of Sun, Planets, Globular clusters, Milky-way, Local systems etc., and finds the Universal gravitational force vector at that instant of time, for that configuration of the Universe.

Can the gravitational effect of Universe be neglected near Sun ?

- Tide caused by Sun and Moon in oceans-- We observe high tide and low tide in the mornings and evenings, or on full-moon-day and no-moon-day.
- These tides are caused by gravitation of Sun and Moon only. So we can not neglect gravitation effect of Sun and Moon on Earth.

- For better accuracies we have to consider planets also….



The resulting bending angles shown in Figure 1.

-These points were falling into vertical lines, when plotted against Solar Elongation Angle.

-In GR, or direct Newtonian gravitation (classical) the resulting theoretical bending calculation depends on the mass and radius of Sun.

-Hence result depends only on radius, but never on Solar Elongation Angle.

-Whereas Dynamic Universe Model considers Gravitational effect of Sun, Planets, Globular clusters, Milky-way, Local systems etc., and finds the Universal gravitational force vector for that instant of time for that configuration of the Universe on the Radio photon.

-Hence bending angle depends more on surrounding configuration and on relative position of Radio photon in the solar system.

ACKNOWLEDGEMENTS:

Goddess Vak continuously guided this work. However, any mistakes came out due to improper implementations / misunderstandings etc are totally mine. I am very much thankful to Prof. K. N. Mishra, BHILAI for his constant persuasion to write this paper.

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