MQ

[ Mechanics of the Quantum ]


Property 7 :


# Galaxy rotation curves hide Rankine model,

# with the BTFR as a friction law in disguise

*" We are like prisoners in Plato's cave,*

*watching shadows on the wall move faster than the real thing "*

This work is published by Koenraad M.L.L. Van Spaendonck          Master in Design Sciences

website : www.vanspaendonck.info                    email : kvanspaendonck1@gmail.com

# Table of contents

Preface

# Preface

*° Recapitulation*

'Mechanics of the quantum' [MQ theory] searches for the *mechanical microprocesses* of the individual and collective behaviour of quanta (interpreted as building blocks of fields, mass, energy, light…) to reveal *strong causality* behind the laws of physics, rather than interpreting things with probabilities and uncertainties.

These days, 'mechanical' solutions are not very fashionable in context of gaining insight in phenomena governing the smallest scales. But then one should ask, why did we conclude that ? Why did we end up with probabilities (but also with infinities) ? Isn't it simply because we have no direct or classical access to those scales from our reference frame of scale of size ?

Whereas before this era, we could easily test or observe things to derive the laws of physics behind them. And we could actually observe buildings blocks (e.g.) of a smaller scale at the foundation of things on a larger scale. Or imagining, understanding and observing that random motion of particles in a fluid, resulted from collisions with fast moving molecules (Brownian motion).

Thus fundamental physics was engaged in imagining a mechanical microprocess, and formalizing it mathematically, to understand a larger scale phenomenon. Our investigation sofar, forces us to respect *the value and explanatory power of micro-mechanical features at the basis of the laws of physics*. Especially due to the extra property 5 **[Ref. 1]** found which links our MQ-model to the atomic realm, previously named GQG-model in the build up of a theory of General Quantum Gravity [See Appendix 4 for properties 1-4 and the associated previous paper references]. And due to property 6 **[Ref. 2]**, **where we found an exact correspondance between accumulative Newtonian mechanical effects, and Gamma as the hallmark of relativistic effects**.

Our reference frame from our level of scale does not allow us to interact mechanically with the smaller or smallest scales. But that doesn't mean that things at those scales don't behave in ways similar to classical mechanical processes. Involving e.g. forces acting upon whatever entities, or the principle of action-reaction, or the principle of the path of least resistance, etc.

My work is focused on linking such processes to the laws of physics, which was induced by exact mathematical and geometrical findings. Hence the choice for an over-arching name of the theory under development : Mechanics of the quantum: MQ. A summary can be found in **Appendix 1**.

And in particular, this research is currently done with our constructed discrete model of energy densities (using a.o. a hybrid concept of problem solving protocols in product design and physics), from which *unifying characteristics emerged*. That is, *they were not fitted a priori into the model*, because the model initially aimed to be a discrete or a quantum model for a causal principle of gravity.

Further investigation of the model reveals new interesting properties. *Without adding new features to the model, or changing the initial setup in any way.* There is also no curve fitting with an abundance of parameters involved in this research.

We stay true to the original model and the original causal principle [See Appendix 1 - intro], and we have done the same for the discovery of the previous 6 properties. Thus we aim to arrive one day at a robust theory of unification with fewer assumptions, while explaining more. *Less is more, only if less does more.*

And besides, fashion often leads to 'more of the same', whereas we need 'less of something different', diversity in problem solving techniques, different angles of approach cooperating, a transdisciplinary modus operandi. I aim to provide one such angle, and I hope that complementary skilled people (theoretical physicists, experimental physicists, engineers, philosophers,...) will look into this work, and extend and improve it with their particular set of knowledge, skills and talents.

# Abstract

° *A dark matter alternative : hypothesis in a nutshell   (connecting to graph p.7)*

The redshift for star orbit velocities, in side-faced galaxy observations, is hypothesized not to be a Doppler shift but an intrinsic redshift of space, hence it's not a velocity indicator. Cfr. geometry of the MQ-model [*], no curve fitting.

Consequently, to obtain *apparent* flat rotation curves, we require a radial drop in circulation velocity ~ 1/r  (r = distance from center). Looking at receding stars, that means an actual Doppler blueshift to counter that intrinsic redshift.

We found that the MQ-model exibits the velocity distribution of a Rankine vortex **[°] and [Ref. 5]** : an ideal forced vortex + an unforced (free) vortex, featuring exactly the equivalent of a galactic solid bulge with an orbit velocity ~ r, followed by a free vortex regime with orbit velocity ~ 1/r. Straight from the geometry, no curve fitting. Note: # quanta on layer r+1 = # quanta on layer r  = constant, but the compression level changes according to r.

Consequently no dark matter is needed: There is no classical gravity at work here, just stars following a Rankine vortex velocity distribution, disguised by the misinterpretation of redshift in side-faced galaxy observations. New prediction replacing the flat curve interval: Doubling the distance quadruples, not doubles the period (see p11).

[*] :

The MQ-model is basically a toy model of a newly introduced causal principle for gravity, featuring an exact mathematical formalization of the contraction of space as a discretized compressible fluid, due to the presence of a gravitational well, black hole, matter, angular momentum. And the size of the quanta of the fluid in the geometry is proportional to the emitted wavelengths, proportional to the distance from the center. **[Ref. 3 – p. 6-12 explaining the graphs in Appendix 2]**

It is a unifying model since the quanta also determine the propagation of light, e.g. doubling the deflection **[Ref. 3 – p. 20,21]**, *and* since the exact same geometry – without any curve fitting – also rolls out the exact ratios for the discrete energy levels of hydrogen excited states **[Ref. 1]**. On top of that, the exact same geometry radially features an *apparent* accelerated expansion of the universe due to once again the same misinterpretation of redshift **[Ref. 3 – p. 12-13] and [Ref. 4 – p. 8,25]**, in the form of an exact mathematical formalism straight from the geometry. Perhaps there's a new paper in it :  " Dark matter and Dark energy : 2 expendable sides of the same coin from a reinterpretation of redshift ". Less is more if less does more.