Dark matter as catalyst or as inhibitor of the nuclear reactions

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ABSTRACT

The X-ray femtoscope predictions: 1) Dark matter has resonances for the chemical elements Cr, Xe and Tm, which corresponds to the forces that gave the name to the WIMPs with adjustment of $R^2 = 0{,}996$ 2). Navier Stokes equations and solutions for the atomic nucleus are robust, since they naturally deliver the values of the following constants: neutron radius $r_n = 0{,}843\ fm$, measured for the first time, nuclear viscosity $0{,}997 \times 10^{22} \leq \nu \leq 1{,}08 \times 10^{23}\ fm^2/s$ and Rydberg constant. 3) Dark matter produce nuclear catalysis.

The X-ray telescope proofs: 1) Fluorescent dark matter has resonances in emission and absorption at low X-ray energies (3.5 keV). 2) Gravity appears indirectly through the first analytical solution to the millennium problem, associated with the Navier Stokes (NS) equations, which govern the stability of the incompressible nuclear fluid, and which have the range of magnitude of the gravity 10^{-30}. 3) Dark matter interacts with baryonic matter as a catalyst or as an inhibitor, so it is not consumed in the nuclear reaction for Chandra X-Ray Galaxy Clusters at $z < 1{,}4$.

OBJECTIVES

General Objective:

- Prove that dark matter act as catalyst or as an inhibitor of nuclear reactions

Specific Objectives:

- Find a relation between the nucleous interactions and the behavior of the galaxies.
- Prove that the speed of nuclear reactions increases or decreases through the intervention of dark matter.
- Find a solution to the Navier-Stokes equation considering the atomic nucleous as an incompresible fluid.

THEOREMS AND ASUMPTIONS

Theorem 1: The logistic probability function is a general solution of the Navier Stokes equation.

Theorem 2: The nuclear force and Navier Stokes force are proportional inside the atomic nucleous $\boldsymbol{F_N} = C\boldsymbol{F_{NS}}$

Theorem 3: Resonanse region. The resonanse cross section is produced by interference between the atomic nucleous and the incoming X-Rays inside the resonanse region, where the boundaries are the surface of the nucleous and K Shell.

Theorem 4: An action on the nuclear Surface produces a reaction in the nuclear volumen and vice versa.

Theorem 5: Dark matter acts as catalyst or as inhibitor of nuclear reactions.

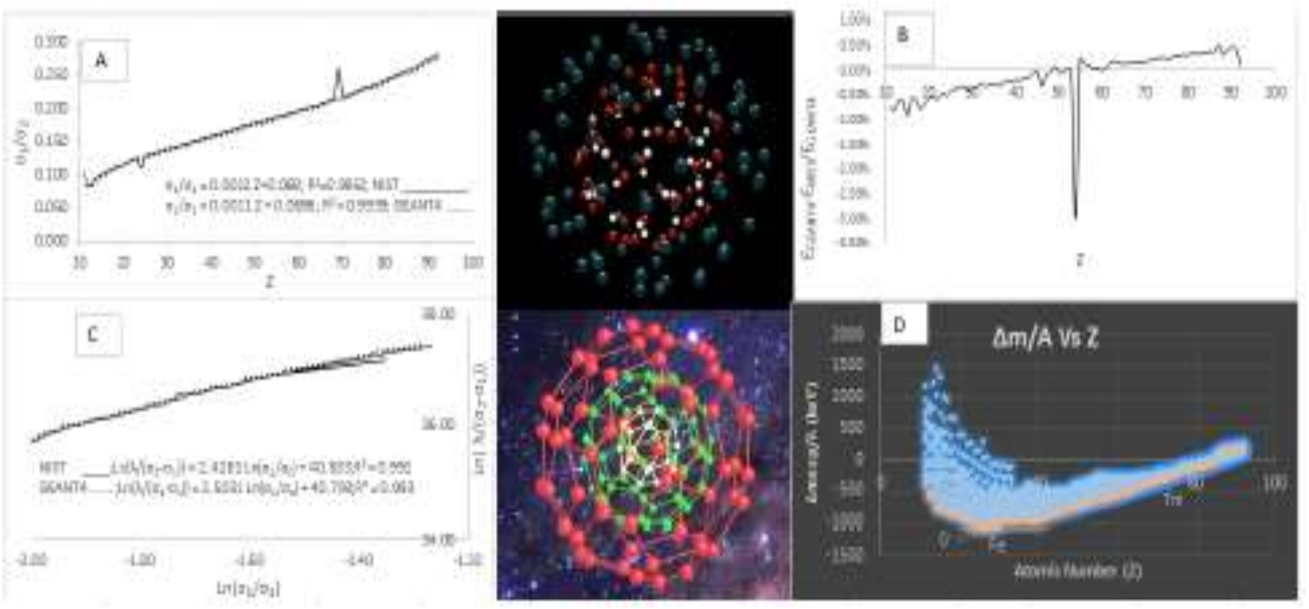
RESULTS

The main results that are related to the X-Ray femtoscope , have to do with the determination of chemical elements that present resonanses in cross section or energy when interaction with dark matter.

To prove the theorem 3 we use the following equation.

$$\frac{8000\pi\bar{r}\lambda}{(\sigma_2 - \sigma_1)} = R_\infty \left(\frac{\sigma_1}{\sigma_2}\right)^{2.5031}$$

This equation allow the calclation of the excess of cross section.



By analyzing the graphs $\frac{\sigma_1}{\sigma_2}$ its clearly concluded that dark matter modifies the cross sections, thus modifing the speed of nuclear reactions.

Proof of theorem 3 in the galactic scale.

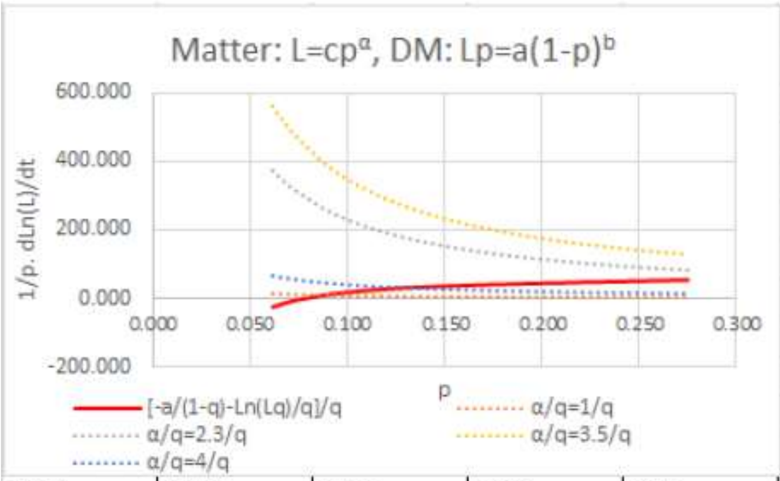
To prove that dark matter modifies the speed of nuclear reactions we´ll use the luminosity of stars in our milky way and some local superculster as the following.

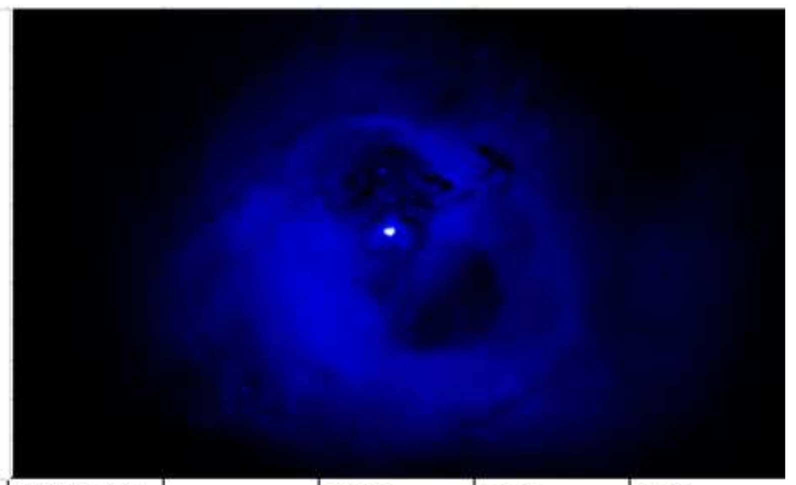
This equation allow us to relationate the luminosity and the mass of stars.

$$\frac{q}{\dot{q}}\frac{d\ln(L_{M+DM})}{dt} \lessgtr \frac{q}{\dot{q}}\frac{d\ln(L_M)}{dt} = cte$$

$$-\frac{b}{1-q} - \frac{\ln(L_M^q)}{q} \lessgtr \alpha = cte$$

To perform a graph for this ecuation we´ll perform for all the values of *q*, whit α=1, 2.3, 3, 3.5, 4…. And we get this graph:





A3921	A3158	A2142	A3112	A 209	PKS0745-191	MACS J0744.8+392	A2244	A 697	A1795
A2034	MKW8	A576	A2597	A3376	ZWCL1215	A496	MACS J0159.8-0849	A2256	A1914
MACS J1311.0-0311	A1995	MACS J0011.7-1523	A2029	A3266	A2219	A2163	A3571	A478	A3395
A3558	A644	A1736	A2218	A2052	A 754	A2319	A2124	A3391	A3667
A2147	A 85	A1413	MACS J0429.6-025	A 773	MKW3S	A1664	A 539	A1201	A2390
A 2589	A1835	A2204	A 1068	A2667	A1361	A1651	A2063	A2717	A2199
A2537	A383	A2657	A 401	A119	A521	A907	A1650	MACS J1115.8+0129	A133
A2744	A3562	A2065	A1689	A 262	A1060	A 399	A963		

CONCLUSIONS

- The solutions of the Navier Stokes equations are usefull to develop models in the X-Ray femtoscope and the X-Ray telescope in the description of dark matter and the nuclear dynamics of galaxies.
- Some predictions made by the X-Ray femtoscope are verified by the X-ray telescope and vice versa because at atomic level, the univers and the stars follow the same laws of physics. Dark matter changing the speeds of nuclear reactions is a prove of that.
- The materials that must be used in dark matter dectection are those that have resonanse whit the atomic nucleous in energy suchs as liquid Xe.
- The X-Ray telescope have a considerable success in the characterization and mapping of the univers while the X-Ray femtoscope complements the research in matter and dark matter in terms of energy, cross-section and resonanse in the nuclear surface.

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