E=MC^2 IN XPXP MODEL

M.D. Earl 2023

A simplistic calculation provides evidence for mass-energy conversion in the XPXP model. It is submitted that matter is converted to energy within concentrated masses, and possibly in galactic centers. The XPXP theory maintains that both matter and space expand as a natural process on all scales. A hypothetical situation wherein a mass to is brought to "rest" in the cosmic expansion will suggest a total loss of energy. The basic equations for Newtonian mechanics may be applied. Given that a mass is expanding with the flow, energy must be applied to prevent that mass from moving in conjunction with the proper flow. The Hubble flow is an example of "free expansion" which provides a model that is as simple as possible. With this in mind, determining the work (energy) necessary to prevent an object from expanding provides an expression for a relationship between energy and mass as seen below:

NEWTONIAN EXPRESSIONS: (Second Law) $F = M \cdot A$

Force = Mass x Acceleration

(Work = Energy) $E = F \cdot D$

Energy = Force x Distance

$E = (M \cdot A) \cdot D$

Converting the associated expressions to XPXP:

R = Distance = Roe^Hot

M = Mass = Mo e^ 3Hot

A = Acceleration = Ho^2Ro e^Hot = HoCo e^Hot

C = Light Speed = Co e^Hot = HoRo e^Hot

E = Energy = $(M \cdot A) \cdot D$

E = (Mo e^ 3Hot · Ho^2Ro e^Hot) · Roe^Hot

E = (Mo e^ 3Hot) · (Ho^2Ro^2 e^2Hot)

E = (Mo e^ 3Hot) · (Co^2 e^2Hot)

$E = M \cdot C^2$

Therefore, the energy necessary to "stop" an exponentially expanding mass in the cosmic flow agrees with Einstein's famous mass/energy relationship. It is proposed that the obstructed expansion of matter within planets and stars produces the internal energy observed in these bodies and corresponds to Einstein's $E = M \cdot C^2$.