Estimating Gravity Field Energy by Gene Preston 9/6/2020

Rs = radius of sun = 695959 meters

M = mass of sun = 1.99e30 kgm

G = 6.672e-11 Newton meters^2 / kgm^2

We will raise 1 kgm from the surface of the sun to infinity and note the increase in mass of the 1 kgm as a per unit value.

F = GMm/r^2 were m = 1 kgm

Work done = GM $\int$ 1/r^2 dr from Rs to infinity

Work = GM (-1/r) from Rs to Infinity = GM/Rs

Converting work to mass = GM/Rs/c^2 where c = 3e8 m/s

Plugging in the numbers (6.672e-11)(1.99e30)/(695950)/(3s8)^2 = .00212 kgm

So the first mass lifted out of the sun causes .00212 per unit increase in the mass.

If we lift all the mass out of the sun the value will be half this or .00106 per unit if we hold the sun's radius constant and deplete the sun's mass the gravity field goes down because M is decreasing. In the end the per unit mass increase is half the first mass removed. So from this we can estimate the sun's gravity field contains about .001 per unit more mass in its gravity field since lowering the mass back into the sun builds up the gravity field and that mass was being converted to gravity field energy or gravity field mass.

Now let's suppose the mass of the gravity field varies by this formula:

Sm + .00106 Sm^2 gives the atomic mass and the gravity field mass of a black hole when measured in Sm or solar masses. If Sm = 1 we get our current sun. What if we plug in the 85 and 66 black hole merger masses. What final mass do we get?

Sm+.00106Sm^2 = 85 + 66 + .00106(85^2 + 66^2) and solving this quadratic for Sm we get 141.98 solar masses. The astronomers said the answer is 142 solar masses. The rest of the mass is in the gravity field around the final 142 mass. I think the physics has been explained well enough to publish.