Dark energy is a sign error, else it is ugly.

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Abstract

The experimental data is beyond dispute. But it relates to the change in composition over time of the class of supernovae that are observed. Instead, the interpretation of the data in terms of the simplest kind of acceleration contains an error in sign. Actually, a recent acceleration of the earth away from the most distant supernovae would leave all of of the supernovae at intermediate distances with a higher - not lower - relative redshift for their distances, in part because these supernovae would have not yet accelerated. My paper, “Neglect of General Covariance” describes the many ways in which the cosmological equation and the Friedmann coordinates violate the principles of relativity. And these violations provide cover for the concept of dark energy and its breaking of the conservation laws. There is a version of dark energy which is conserved, but this does lead to the error in sign. Annotations to this argument follow below. Then the ugliness of the alternative to the error in sign is physically described, and the conservation laws are defended.

Notes

It has been argued before that the first generation supernovae of this type contained low amounts of metal, thus they were of lower density and more massive when they detonated. And the supernova progenitors that rotate fast, as well as the supernovae that are set off by collision, would be not only brighter, but also delayed in their detonation by billions of years. So it is only reasonable to think that supernovae of intermediate age should have been less bright.

It should be remembered that incremental accelerations affect relative velocity before distance, and that the effects of acceleration are intrinsically greater than the effects of the corresponding spacial curvature, this being so for any subluminal source of gravity.

It has also been argued before that the cosmological constant sets off changes in the volume of a region with shifts of coordinates. So putting the earth off center in the cosmological coordinates is an important check on consistency. The most distant supernovae can be centered instead.

The violations of general covariance, relativity, and conservation by the cosmological equation and Friedmann coordinates are so egregious that they destroy understanding of things on a cosmological scale. For this argument, and for the general remedies, I refer you to my other papers, “Neglect of General Covariance”, and “Draw the Metric!”.

The Ugly Constant

The cosmological constant requires that new sources of repellent gravity would come into being, perfectly stationary on average at the location of the cosmologists who eagerly await the new being. This would be of course a violation of conservation laws. Also, perfectly superluminal at the behest of the enthusiastic crowd, there would appear, simultaneously from infinity and all of the three general directions, sources of divergent curvature. And either these would be also not conserved, or else they would have made their way though distant regions of the universe that are still young by their redshift relative to the location of the cosmological partisans. And these would be perfectly superluminal, with infinite speed for the median, all this only at the location and cruise rate preferred by the fans. Other observers, not so elite, at different locations and speeds will experience this as not quite so special.

Conservation

The conservation laws are not arbitrary facts extrapolated from observation. Instead they are theorems deduced from the context of a spacetime with an abstract metric. The existence of the abstract metric means that there is some method by which qualified observers can be made to agree on the magnitude of intervals in spacetime. My papers describe in more detail this derivation of the conservation laws, and also the behavior of metrics that are specific to particular coordinates.

When there is a coordinate system sufficiently well behaved, then the Bianchi identities are applied to the coordinate specific metric to yield the conservation laws, when translated to the language of mechanics by way of gravity. And the Bianchi identities are not arbitrary assertions either, since they embody the topological truism, “The boundary of a boundary is zero.”.

A proper coordinate system dramatically simplifies these needed geometric proofs. The principle of general covariance then exports surety to the general case. And geometric proofs are primary to this context. Algebraic solutions are not native to this kind of physics.

The Friedmann coordinates do not qualify as well behaved. They are neither covariant, orthogonal, nor homogeneous. So, in themselves, the Friedmann coordinates create confusion of various kinds. Errant rays of light and bits of matter have a curved path through this picture of reality.

I wonder if devotees of non conservation could contemplate fading away, with a chance of not reappearing in the transport room of the great starship!