

Quantum Gravity 292.994: Velocity versus Acceleration Domination (Canada)

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From Osher Doctorow

From 292.993, noting that force is the time rate of change of momentum

and that momentum loses influence while the acceleration part of force (or force divided by mass) gains influence as the Universe shifts from gravitation-dominated to accelerated-dominated (which appears to be either periodic or alternating), it would seem that velocity rather than acceleration should be implicated in initial Universe scenarios.

This appears to agree with Canadian researchers' paper "Velocity dominated singularities in the cheese slice universe," Dan Gian and Charles C. Dyer, University of Toronto Canada, arXiv: 0810.1680 v1 [gr-qc] 9 Oct 2008, 11 pages. Lest it be thought that the cheese slice universe is an esoteric model, it actually may be better than the FLRW Universe usually assumed in Cosmology in accounting for inhomogeneities observed in small and large scale structure and observed layering in distribution of galaxies.

To make a long story short, a certain formulation of the Einstein Field Equations in which spatial derivatives are "zeroed out" but not time derivatives, yields velocity term dominated solutions (VTD), and this property asymptotically (AVTD) seems to be inherited by singularities and by matching together exact solutions using what are called Darmois matching conditions – that is to say, cosmologies are constructed by matching together different spacetimes and asking what singularity structure inherits from matching and whether late time matching implies in any sense well behaved matching at singularities.

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