Averaging in Spherically Symmetric Cosmology

We discuss the averaging problem in general relativity using the form of the macroscopic gravity equations in the case of spherical symmetry in volume preserving coordinates. In particular, we calculate the form of the correlation tensor under some reasonable assumptions on the form for the inhomogeneous gravitational field and matter distribution. On cosmological scales, the correlation tensor in a Friedmann-Lemaitre-Robertson-Walker background is found to be of the form of a spatial curvature.

On astrophysical scales the correlation tensor can be interpreted as the sum of a spatial curvature and an anisotropic fluid. We briefly discuss the physical implications of these results.