

Abstract Submitted
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Transitions in expanding cosmological spacetimes BEVERLY K. BERGER, Retired — One may easily construct a sequence of vacuum spacetimes by starting with the spatially homogeneous, anisotropic, vacuum Kasner solution and adding one direction of spatial dependence (polarized Gowdy), rotations in the spatial symmetry plane (generic Gowdy), and the remaining allowed spatial rotations (Gowdy plus twists). In the time-direction of expanding spatial volume, the spatially dependent cases may be analyzed as averaged background spacetimes containing gravitational waves. The nature of the averaged background spacetime is known to change abruptly in moving from Kasner to Gowdy to Gowdy with twists. In addition, as pointed out by Ringstrom, generic Gowdy models exhibit two distinct behaviors for the averaged wave amplitude. The focus is on transitions involving the introduction of twists where the phenomenology is not well understood. Numerical simulations are used to study the details of the behavior in the transition from one case to another especially to investigate possible scaling relationships. A final topic will be the effect of the addition of matter and/or a cosmological constant to these models.

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