Gowdy Spacetimes with a Positive Cosmological Constant

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Abstract

Assuming U(1) symmetry of solutions we construct a fully constrained scheme for Einstein equations on compact spatial domains with $\mathbb{S}^2 \times \mathbb{S}^1$ and $\mathbb{S}^3$ topology. Performing Geroch reduction and choosing appropriate gauge we rewrite Einstein equations into a system of elliptic and hyperbolic equations which are suitable for numerical computations. Following the approach of Beyer, Escobar and Frauendiener [1, 2] we use the spin-weighted spherical harmonics to deal with the singularities of spherical polar coordinates. Extending the results of [1, 2] we apply the scheme to *rotating cosmologies* initial data with U(1)×U(1) symmetry found by Bizoń, Simon and Pletka [3].

References

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