General Relativity and Quantum Cosmology

Solutions of the sDiff(2)Toda equation with SU(2) Symmetry

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We present the general solution to the Plebanski equation for an H-space that admits Killing vectors for an entire SU(2) of symmetries, which is therefore also the general solution of the sDiff(2)Toda equation that allows these symmetries. Desiring these solutions as a bridge toward the future for yet more general solutions of the sDiff(2)Toda equation, we generalize the earlier work of Olivier, on the Atiyah-Hitchin metric, and re-formulate work of Babich and Korotkin, and Tod, on the Bianchi IX approach to a metric with an SU(2) of symmetries. We also give careful delineations of the conformal transformations required to ensure that a metric of Bianchi IX type has zero Ricci tensor, so that it is a self-dual, vacuum solution of the complex-valued version of Einstein's equations, as appropriate for the original Plebanski equation.

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