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Emergence of constant curvature spacetimes with an effective charge and cosmological constant in loop quantum cosmology ANTON JOE, Department of Physics and astronomy, Louisiana State University, Baton Rouge, LA 70803, U.S.A., NARESH DADHICH, Centre for Theoretical Physics, Jamia Millia Islamia, New Delhi 1100 25, India, PARAMPREET SINGH, Department of Physics and astronomy, Louisiana State University, Baton Rouge, LA 70803, U.S.A. — The loop quantum dynamics of Kantowski-Sachs and the interior of higher genus black hole spacetimes with cosmological constant has some peculiar features not shared by various other spacetimes in loop quantum cosmolgy. As in the other cases, though the quantum geometric effects resolve the singularity and result in a bounce, after the bounce a spacetime with small spacetime curvature does not emerge at late times. Instead, asymptotically the spacetime has constant spacetime curvature with a product manifold. Interestingly, though the spacetime curvature of these asymptotic spacetimes is very high, the effective metric of these spacetimes is a solution to the Einstein field equations. Analysis of the components of the Ricci tensor shows that after the singularity resolution, the Kantowski-Sachs spacetimes lead to an effective charged Nariai, and, the higher genus black hole interior lead to an anti Bertotti-Robinson spacetime with an effective tachyonic charge. The asymptotic spacetimes have an effective cosmological constant which is different in magnitude, and sometimes even its sign, from the cosmological constant in the Kantwoski-Sachs and higher genus black hole metrics.

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