

# A Note on Pathria's Model of the Universe as a Black Hole<sup>†</sup>

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Received January 19, 2010; in final form, February 22, 2010

**Abstract**—Pathria has shown that, for the certain values of the cosmological constant, a pressureless closed Friedmann-Robertson-Walker universe can be the interior of a Schwarzschild black hole. We examine Pathria's model from the point of view of matching of two different spacetimes through a null hypersurface. We first regard the event horizon of the black hole, which in Pathria's model is identified with the radius of the universe at the point of its maximum expansion, as a null hypersurface separating the FRW interior from the vacuum Schwarzschild exterior, and then use the null shell formalism for it. It turns out that matching is not smooth, and in fact, the null hypersurface is the history of a null shell admitting a surface pressure.

**DOI:** 10.1134/S0202289310020131