STATIC SPHERICALLY SYMMETRIC INTERIOR SOLUTIONS WITH NONUNIFORM DENSITY

¹M. A. KAUSER & ²Q. ISLAM

¹Department of Mathematics, Chittagong University of Engineering & Technology, Chittagong-4349, Bangladesh ²Research Centre for Mathematical and Physical Sciences, University of Chittagong, Chittagong-4331, Bangladesh

ABSTRACT

For the highly nonlinearity conditions, it is so much difficult to obtain exact solution of Einstein's field equations. Many authors have been working on the investigation of exact solution of Einstein's equation. One of these solutions, Schwarzschild uniform density solution is unphysical. In this paper, we have applied the Adler method to obtain Einstein's equations solution in use of different equation of state. We got a new solution although it is Tolman's solution no IV. But our solution is different and original. We have described the obtain solution in terms of two new variables. Also we have shown that maximum mass of 1/3 the fluid radius (in geometric units) which is less than Adler's 2/5 or Schwarzschild 4/9.

KEYWORDS: Non-Uniform Density, Exact Solution, Equation of State, Uniform Density