ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

11. Mathematical Physics

1991 MS Classification: 83-XX

Dryuma, Valery, Institute of mathematics AS Moldova (Kishinev)

Integration of Einstein equation for higher-dimensional space

The vacuum Einstein equations for ten- and six- dimensional spaces with orthogonal metrics in form $ds^2 = \varphi(u^k)\sum_{\alpha=1}^{4}[(du^\alpha)^2]\sum_{i=1}^{6}[(H^i)^2(u^k)(du^i)^2]$ depending from the lesser number of variables are considered. The full system of Einstein equation in this case consist of equations forming a multidimensional generalization of Lame-Darboux system for triply-orthogonal surfaces in three-dimensional flat space and can be integrate with help of the Inverse Scattering Method. Using the representation of the functions $\varphi(u^k)$ and $H^i(u^k)$ as the following $\varphi = \phi(u^k, \lambda) = \exp[\frac{A_1}{\lambda} + \frac{B_1}{\lambda-1} + \frac{C_1}{\lambda+1} + \lambda D_1]$ and $H_i = h_i(u^k)\exp[\frac{A_2}{\lambda} + \frac{B_2}{\lambda-1} + \frac{C_2}{\lambda+1} + \lambda D_2]$, where λ is "spectral" parameter and A_i, B_i, D_i are some functions of variables u^k, a large number of exact solutions of Einstein equations are constructed. Considering four-dimensional Einstein space as embedded in higherdimensional spaces the applications of these solutions to the problems of astrophysics and modern cosmology are discussed.