Vacuum Einstein spaces with axial symmetry

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Abstract

Four classes of solutions are found to the equations $R_{\alpha\beta}=-2\sigma_{;\alpha}\,\sigma_{;\beta}$ and $g^{\alpha\beta}\,\sigma_{;\alpha\beta}=0$ in three-dimensional space with metric $g_{\alpha\beta}dx^{\alpha}dx^{\beta}$ and signature (+ --), equivalent to the Einstein equations $R_{ij}=0$ in a vacuum for the metric {Mathematical expression}. The metric ds^2 assumes axial symmetry and symmetry with respect to the reflection {Mathematical expression}. © 1977 Plenum Publishing Corporation.