Russian Physics Journal 1996 vol.39 N5, pages 460-465

Algebraically special gravitational fields with single-parameter motion groups

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Abstract

The Newman-Penrose equations for the general class of algebraically special gravitational fields with both nonzero and zero cosmological constants are reduced for gravitational fields outside of the field sources. Then new classes of exact solutions of the nondegenerate Petrov II type are derived under the additional requirement that a single-parameter group of isometric motions exist.