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7. Lie Groups and Lie Algebras

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Barannyk, Lyudmyla L., Institute of Mathematics, National Academy of Sciences of Ukraine, Kyiv, Ukraine Barannyk, Leonid F., Pedagogical University, Słupsk, Poland

On an algorithm for classifying subalgebras of the Poincaré algebra $AP(2,n)$

The Poincaré algebra $AP(2,n)$ contains as subalgebras the pseudoorthogonal algebra $AO(2,n)$ that is isomorphic with the conformal algebra $AC(1,n-1)$, the Poincaré algebra $AP(1,n)$, the extended Poincaré algebra $A\tilde{P}(1,n-1)$, the extended Galilean algebra $AG_2(1,n-1)$, the full Galilean algebra $AG_4(n-2)$. Subalgebras of each of these algebras were used to construct invariant solutions to many nonlinear equations of mathematical physics. The procedure of constructing invariant solutions stipulates that subalgebras of an invariance algebra for a given equation are beforehand classified up to the conjugation with respect to the group of inner automorphisms of this algebra. We substantiate an algorithm for classifying subalgebras of the algebra $AP(2,n)$ for an arbitrary $n \geq 3$ up to the conjugation with respect to the group of inner automorphisms of this algebra.

Reference: L. L. Barannyk, and L. F. Barannyk, On classification of subalgebras of the Poincaré algebra $AP(2,n)$, Dopovidi Nats. Akad. Nauk Ukrainy **8** (1998) (in Ukrainian, to appear).