Specialisations of generalised Drinfel'd-Sokolov hierarchies

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The primary objective of this work is to extend the existing body of research on specialisations of Drinfel'd-Sokolov hierarchies of partial differential equations and to provide some examples thereof.

The hitherto established results on specialisations are reinterpreted and their intrinsic Lie algebraic essentials analysed. This permits the extension of these ideas to the so-called generalised Drinfel'd-Sokolov hierarchies developed in recent years.

The crucial generalisation is that of a certain root space automorphism which is then lifted appropriately to the associated affine Lie algebra. Most importantly, this automorphism is shown to be gradation preserving, with respect to a gradation associated with the relevant Heisenberg subalgebra. Such an automorphism then lends itself to defining specific specialisations of the generalised Drinfel'd-Sokolov hierarchies.

Integrable systems result from these constructions that are new in the sense that they are associated with nonstandard twisted type algebras determined by the fixed point subspace of the aforementioned automorphism.

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