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Extended superconformal Galilean symmetry in Chern-Simons matter systems. (English)

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Summary: We study the nonrelativistic limit of the $N = 2$ supersymmetric Chern- Simons matter system. We show that in addition to Galilean invariance the model admits a set of symmetries generated by fermionic charges, which can be interpreted as an extended Galilean supersymmetry. The system also possesses a hidden conformal invariance and then the full group of symmetries is the extended superconformal Galilean group. We also show that imposing extended superconformal Galilean symmetry determines the values of the coupling constants in such a way that their values in the bosonic sector agree with the values of Jackiw and Pi for which a self- dual equation exists. We finally analyze the second quantized version of the model and the two-particle sector.

MSC:

53Z05 Applications of differential geometry to physics
83C20 Classes of solutions; algebraically special solutions, metrics with symmetries for problems in general relativity and gravitational theory

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