

Verheyen, Rob

RGIssearch: a C++ program for the determination of renormalization group invariants.
(English) [Zbl 1348.81028](#)
[Comput. Phys. Commun.](#) 202, 351-355 (2016).

Summary: RGIssearch is a C++ program that searches for invariants of a user-defined set of renormalization group equations. Based on the general shape of the β -functions of quantum field theories, RGIssearch searches for several types of invariants that require different methods. Additionally, it supports the computation of invariants up to two-loop level. A manual for the program is given, including the settings and set-up of the program, as well as a test case.

MSC:

- 81-04** Software, source code, etc. for problems pertaining to quantum theory
- 81T17** Renormalization group methods applied to problems in quantum field theory

Keywords:

[renormalization](#); [computer algebra](#); [sparse linear systems](#)

Software:

[RGIssearch](#)

Full Text: [DOI](#) [arXiv](#)

References:

- [1] Hetzel, J.; Beenakker, W., Renormalisation group invariants and sum rules: fast diagnostic tools for probing high-scale physics, *J. High Energy Phys.*, 1210, 176 (2012), [arXiv:1204.4336](#)
- [2] Demir, D. A., Renormalization group invariants in the mssm and its extensions, *J. High Energy Phys.*, 0511, 003 (2005), [arXiv:hep-ph/0408043](#)
- [3] Carena, M.; Draper, P.; Shah, N. R.; Wagner, C. E., Determining the structure of supersymmetry-breaking with renormalization group invariants, *Phys. Rev. D*, 82, Article 075005 pp. (2010), [arXiv:1006.4363](#)
- [4] Beenakker, W.; van Daal, T.; Kleiss, R.; Verheyen, R., Renormalization group invariants in supersymmetric theories: one- and two-loop results, *J. High Energy Phys.*, 10, 014 (2015)
- [5] Duff, I. S.; Erisman, A. M.; Reid, J. K., *Direct Methods for Sparse Matrices* (1986), Oxford University Press, Inc.: Oxford University Press, Inc. New York, NY, USA · [Zbl 0604.65011](#)
- [6] Brown, W. S., The subresultant PRS algorithm, *j-TOMS*, 4, 3, 237-249 (1978) · [Zbl 0385.68044](#)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.