Right coideal subalgebras

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Right coideal subalgebras

Formal definition:

Computing of the number of right coideal subalgebras of $Uq(\mathrm{so}_{2n+1})$.

- Complete the classification of right coideal subalgebras containing all grouplike elements for the multiparameter version of the quantum group $Uq(\mathrm{so}_{2n+1})$, $qt = 1$. It is known that every such subalgebra has a triangular decomposition $U = U-HU+$, where $U-$ and $U+$ are right coideal subalgebras of negative and positive quantum Borel subalgebras.

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Right coideal subalgebras

- Computing description:
  - Main argument (N).
  - Building of an array of vectors, with size of N+1 for each vector, with specific building rules.
    - 2 approaches (Time expensive, Space expensive).
    - Array size (2N*N!)
  - Compatibility and computing rules.
    - $(2N*N!)^2$

Right coideal subalgebras

- Parallel issues.
  - Data oriented parallelization.
  - No data dependency among decomposition units.
  - Easy domain decomposition. Not overlap zones.

Right coideal subalgebras

- Current achivements:
  - Sequential version C++ STL. N=5. Full App.
  - MPI version C++ up to N=7 HP Supercomputer 128 cores 20 hours. Eficiency 99%. Full App.
  - Command line JDL parametric version running at GISELA grid. Core of computing part. Gathering and job control still missing.
  - Sequential version for Science Gateway by hostname portlet with GILDAVM.

Right coideal subalgebras

- Domain single partition version for Science Gateway by hostname portlet with GILDAVM.
- First steps to get a specific portlet version based on Riccardo Bruno's hostname GILDAVM portlet.

All Science Gateway versions were obtained with Dr. Diego Scardaci (INFN Catania) teaching and technical support.

Aims:

- Produce a full specific portlet version and Porting it to Science Gateway.
- Obtain results for N=8 and so on.