GC_ReadmeN9 for the grobcov.lib library
Release N9 (February 2020)

After downloading **grobcov** you will obtain the
folder grobcovN9.

- Folder grobcovN9 contents:

  1) grobcov.lib (version N9 of the library),
  2) The file   GC_EXAMPLES.sg,
     to be read in Singular that uses grobcov.lib:
  3) The file   GC_HELPS.sgw
     Which results of reading and executing the
     previous *.sg file in Singular.

Copy these 3 files into your Singular directory.

You do not need to execute the *.sg file
as the result can be seen in the corresponding *.sgw file.
Nevertheless, you can execute them by reading them
in Singular, to verify that your installation is correct.

These files are given to facilitate the use of the Singular
grobcov.lib library, programmed by Antonio Montes and containing the
Montes-Wibmer algorithm for computing the Gröbner cover a of parametric ideal.

If you want to obtain the latest actualization of the library grobcov.lib, you can
download it from the web:
https://mat.upc.edu/en/people/antonio.montes/
containing the files described here. The basic routines are:

grobcov, cgsdr, extendGC, extendpoly,
pdivi, pnormalf, Crep, Prep, PtoCrep,
ConsLevels, Levels, DiConsLCSets, Grob1Levels,
locus, stdlocus, lodusdg, locusto, discrim,
envelop, AssocTanToEnv, FamElemsAtEnvCompPoints
ADGT, intersectpar,
WLemma

The new version N9 includes procedures for computing:
- Comprehensive Groebner System (CGS) (Kapur-Sun-Wang),
- canonical Groebner Cover of a parametric ideal (grobcov) (Montes-Wibmer),
- canonical union and representation of constructible sets (Brunat-Montes)
- loci computation and taxonomy (Abanades, Botana, Montes, Recio) and applications
to dynamic geometry,
- envelop computation and taxonomy (Montes et al.) and applications to dynamic
geometry.
- Automatic Deduction of Gewometric Theorems (ADGT)

The book:

"The Gröbner Cover". A. Montes. Algorithms and Computation in Mathematics, 27. Springer (2019) can be used as Manual of the library.

Articles describing algorithms included in the library are:

- Comprehensive Groebner System (GCS) (KSW algorithm):

D. Kapur, Y. Sun, and D.K. Wang.
"A New Algorithm for Computing Comprehensive Groebner Systems".
Proceedings of ISSAC'2010, ACM Press, (2010), 29-36.

- Groebner Cover of a parametric ideal :

A. Montes, M. Wibmer.
"Groebner Bases for Polynomial Systems with Parameters."
Journal of Symbolic Computation 45 (2010) 1391 - 1425.

- Loci computation:
Abanades, Botana, Montes, Recio:
"An Algebraic Taxonomy for Locus Computation in Dynamic Geometry".
Computer-Aided Design 56 (2014) 22-33.

- Canonical representation of consructible sets:
A. Montes, J.M. Brunat,
"Computing the canonical representations of constructible sets".
Math. Comput. Sci (2016) 10:165-178.

- ADGT:
A. Montes,
"Automatic Deduction of Geometric Theorems using the Gröebner Cover",
Proceedings of EACA 2018.

- Envelop computation: (see the book)