GC_ReadmeN12 for the grobcov.lib library
Release N12 (February 2021)

After downloading **grobcov** you will obtain
The file grobcovN12.zip.
Extracting it you will obtain the folder grobcovN12.

- Folder grobcovN12 contents:

1) grobcov.lib (version N12 of the library),
2) The file   GC_EXAMPLES.sg,
    to be read in Singular. It uses grobcov.lib:
3) The file   GC_HELPS.sg
    to be read in Singular. It uses grobcov.lib:
4) The file GC_Book_lo.sg to be executed
    in Singular with all the exemples of locus
    in the book The Groebner Cover
5) The file GC_Book_lo.sgw with the
    result of the execution of GC_Book_lo.sg.
6) The file GC_Book_env.sg to be executed
    in Singular with all the exemples of envelop
    in the book The Groebner Cover
7) The file GC_Book_env.sgw with the
    result of the execution of GC_Book_env.sg

Copy these files into your Singular directory.

After installing version N12 of grobcov.lib, you can execute in Singular

➢ LIB "grobcov.lib";
➢ <"GC_EXAMPLES.sg";
➢ <"GC:HELPS.sg";
➢ <"GC_Book_lo.sg";
➢ <"GC_Book_.env.sg";
➢

that will help you as guide for the use of the library

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, DifConsLCSets, Grob1Levels,

locus, stdlocus, lodusdg, locusto, discrim,
envelop, AssocTanToEnv, FamElemsAtEnvCompPoints
ADGT, intersectpar,
WLemma

The new version N12 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)
- Automatic Deduction of Geometric Theorems (ADGT)
- loci computation with their taxonomies (Abanades, Botana, Montes, Recio) and
applications to dynamic geometry,
- envelop computation and taxonomy (Montes et al.) and applications to dynamic
geometry.
- locus end envelop have been actualized and accept now parametric locus and
parametric envelopes.

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.