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RatProbAlgTori for GAP 4 ver.2018.05.22

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Needs: [GAP](#), version $\geq 4.4.12$; GAP package [carat](#), version $\geq 2.1b1$; GAP package [crystcat](#), version $\geq 4.1.6$; GAP package [HAP](#), version $\geq 1.10.6$; GAP package [SONATA](#), version ≥ 2.4

Current version: [RatProbAlgTori-2018.05.22.zip](#) (Buildcarat.sh was modified to ver.2017.06.18; BuildCarat.sh was added to ver.2012.10.08)

Contact: [Akinari Hoshi](#), [Aiichi Yamasaki](#).

URL:

<http://mathweb.sc.niigata-u.ac.jp/~hoshi/Algorithm/RatProbAlgTori/index.html>

<https://www.math.kyoto-u.ac.jp/~yamasaki/Algorithm/RatProbAlgTori/index.html>

Description

This code provides algorithms for (stably, retract) rationality problem for algebraic tori.

Installation

1. (for Windows) Install [VMware](#) (in suitable Language).
(for Mac OSX) Install [VMware Fusion](#) (in suitable Language).
2. Install [Ubuntu](#) ([Japanese ver.](#)) on VMware.
Over 2GB memory on Ubuntu is recommended.
3. Download [GAP](#) and unpack it on Ubuntu to $\sim/$ ($/\text{home}/\text{username}$).
Go to $\sim/\text{gap4r8}$ (Type "`cd $\sim/\text{gap4r8}$` ") and type "`./configure`".
If "Please install m4 or build without GMP." appeared, type "`sudo apt install m4`" then type "`./configure`" again.
Type "`make`".
Go to $\sim/\text{gap4r8}/\text{pkg}$ (Type "`cd $\sim/\text{gap4r8}/\text{pkg}$` ") and type "`../bin/BuildPackages.sh`".
4. Download [RatProbAlgTori.zip](#) and unpack it to $\sim/$ ($/\text{home}/\text{username}$).
Go to $\sim/\text{RatProbAlgTori}$ (Type "`cd $\sim/\text{RatProbAlgTori}$` ") and type "`chmod +x BuildCarat.sh`".
Go to $\sim/\text{gap4r8}/\text{pkg}$ (Type "`cd $\sim/\text{gap4r8}/\text{pkg}$` ") and type " `$\sim/\text{RatProbAlgTori}/\text{BuildCarat.sh}$` ".
Go to $\sim/\text{RatProbAlgTori}$ (Type "`cd $\sim/\text{RatProbAlgTori}$` ") and type " `$\sim/\text{gap4r8}/\text{bin}/\text{gap.sh}$` ".
If you can see "`gap>`", the installation was successful.
Then type "`Read("RatProbAlgTori.gap");`" on GAP.

Documentation

BuildCarat [[.html](#), [.pdf](#)]

caratnumber [[.html](#), [.pdf](#)]

cohomology [[.html](#), [.pdf](#)]

crystcat [[.html](#), [.pdf](#)]

crystdat [[.html](#), [.pdf](#)]

crystlst [[.html](#), [.pdf](#)]

FlabbyResolution [[.html](#), [.pdf](#)]

GLnQ [[.html](#), [.pdf](#)]

KS [[.html](#), [.pdf](#)]

README [[.html](#), [.pdf](#)]

Content

```
RatProbAlgTori-2018.05.22.zip--RatProbAlgTori--Bravais.gap
+-BuildCarat.sh
+-BuildCarat.pdf
+-BuildCarat.old.2017.06.18.sh
+-carat2crystcat.txt
+-caratcnpol.txt
+-caratnumber.gap
+-caratnumber.pdf
+-cohomology.g
+-cohomology.pdf
+-cryst1.txt
+-cryst2.txt
+-cryst3.txt
+-cryst4.txt
+-cryst5.txt
+-cryst6.txt
+-crystcat.gap
+-crystcat.pdf
+-crystdat.zip (9 files included)
+-crystdat.pdf
+-crystlst.pl
+-crystlst.pdf
+-FlabbyResolution.gap
+-FlabbyResolution.pdf
+-GLnQ.zip (6 files included)
+-GLnQ.pdf
+-H1cryst.txt
+-Hn.gap
+-KS.gap
+-KS.pdf
+-RatProbAlgTori.gap
+-README.txt
+-README.pdf
+-RatProbAlgTori-2018.05.22.pdf
```

References

[HY17] Akinari Hoshi and Aiichi Yamasaki, Rationality problem for algebraic tori, Mem. Amer. Math. Soc. **248** (2017) no. 1176, v+215 pp. [AMS](#) Preprint version: [arXiv:1210.4525](#).

RatProbAlgTori is a free software.
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Last modified: 2024-09-25