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# BCAlgTori for GAP 4 ver.2025.09.28

**Authors:** Akinari Hoshi, Aiichi Yamasaki.

**Needs:** [GAP](#), version  $\geq 4.9.3$ ; GAP package [HAP](#), version  $\geq 1.12.6$ ;

**Current version:** [BCAlgTori-2025.09.28.zip](#)

(AutWSEC, IdCoset, MaximalGroups, MaximalInvariantNormalSubgroups in FlabbyResolutionBC.gap was added)

(SearchP1 in FlabbyResolutionBC.gap was modified)

**Old version 2:** [BCAlgTori-2022.01.27.zip](#)

(SearchPFilterRowBlocks in FlabbyResolutionBC.gap was modified)

**Repository of old version 2:** KURENAI (Kyoto University Research Information Repository) <https://doi.org/10.57723/289564>

**Old version 1:** [BCAlgToriver.2021.12.07.zip](#)

(CharacteristicCyclotomicPolynomial, CharPolyList in crystcat.gap were added;

`CrystCatQClass`, `eigen22` in `crystcat.gap` were modified where `crystcat.gap` was given in [RatProbAlgTori for GAP 4 ver.2017.06.18](#) and [MultInvField for GAP 4 ver.2018.11.03](#) in order to work in GAP 4.9.3)

**Contact:** Akinari Hoshi, Aiichi Yamasaki.

**URL:**

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

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

## Description

This code provides algorithms for birational classification for algebraic tori.

## Installation

Download [BCAlgTori-2025.09.28.zip](#) and unpack it to ~/ (/home/*username*).

Then type "Read("BCAlgTori.gap");" on GAP.

## Documentation

```
crystcat [.html, .pdf]
```

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

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

# Content

```
BCAlgTori-2025.09.28.zip-+-BCAlgTori.gap
+-crystcat.gap
+-crystcat.pdf
+-FlabbyResolutionBC.gap
+-FlabbyResolutionBC.pdf
+-FlabbyResolutionBCver.2021.12.07.gap
+-FlabbyResolutionBCver.2022.01.27.gap
+-NonInv.dat
+-README.txt
+-README.pdf
+-TorusInvariants.dat
+-WeakStablyEquivalentClass.dat
```

## References

[HY] Akinari Hoshi and Aiichi Yamasaki, Birational classification for algebraic tori, [arXiv:2112.02280](#).

BCAlgTori is a free software.

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