Stable packing of planar convex bodies

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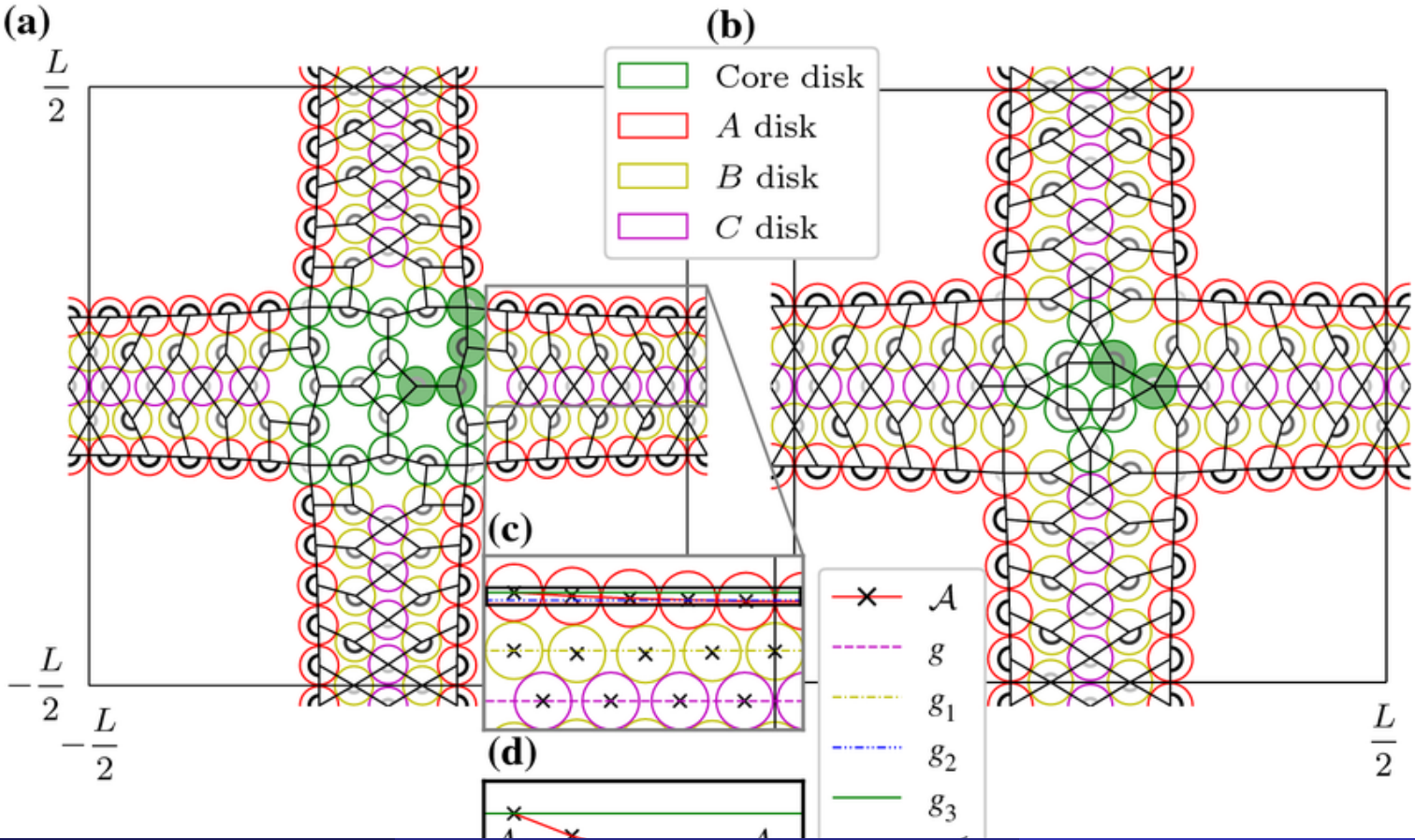
Böröczky packing

Packing of disks

There is a stable packing of congruent disks on the plane with zero density.



Stable packing of planar bodies

Translation stable packing

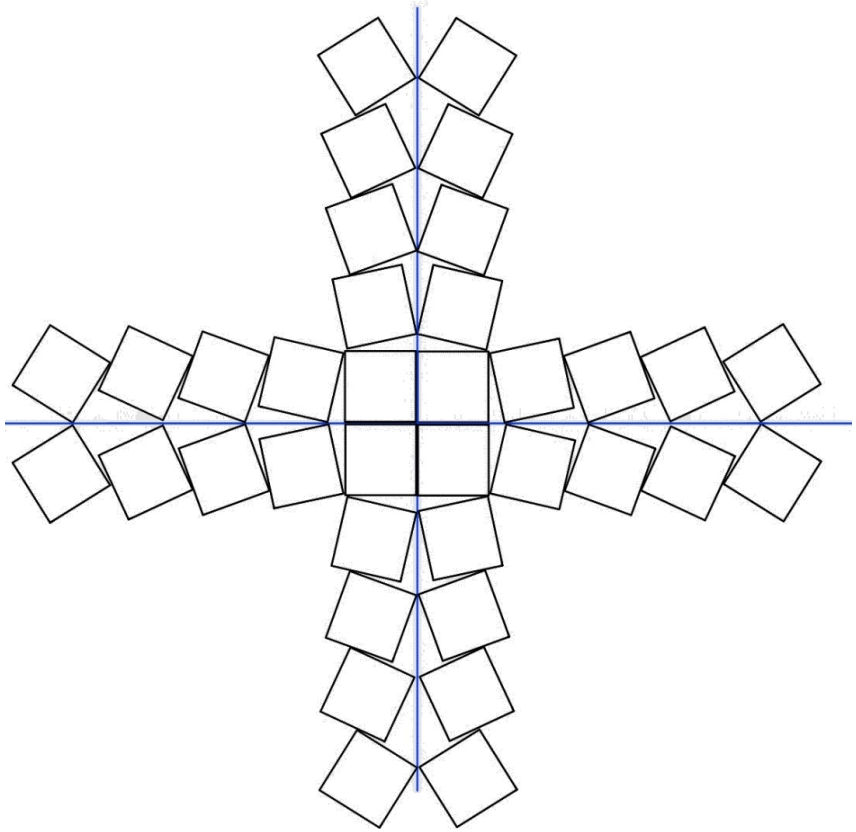
A packing of a family of convex bodies on the Euclidean plane is *translation stable*, if for every member of the family K and every translation $t \in \mathbb{R}^2$, there is a scalar $s \in (0, 1]$ for which $K + st$ intersects another member of the family.

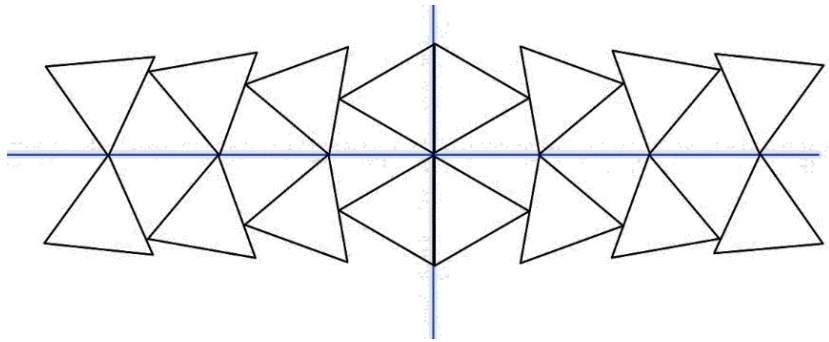
We can consider stable packings where the rotation of the convex bodies are considered as well.

Stable packing for convex bodies

Stable packing for the square and regular triangle

There is a translation stable packing of congruent squares of zero density. There is also a translation stable packing of congruent regular triangles of zero density.





Stable packing of a finite family of convex bodies

Using the methods for the square and the regular triangle it is true that any regular polygon can be packed stably with zero density.

Finite Stable packing

There is no finite family of convex sets for which a stable packing can be achieved.

Here we prove that the packing can consist of different convex bodies, but there is no stable packing of them, if we can use only finitely many copies of them.

Possible further continuations

- Isometry stable packings
- Proving that any convex body can be packed stably with zero density.
- Stable packing of convex bodies in $\mathbb{R}^3$ with zero density.