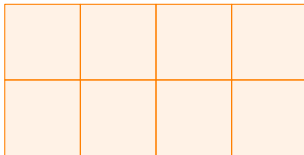


Definition of tiling billiards

Definition

A tiling billiard is a dynamical system whose trajectories are:

- *in a polygonal tiling,*

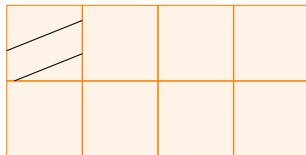


Definition of tiling billiards

Definition

A *tiling billiard* is a dynamical system whose trajectories are:

- in a polygonal tiling,
- in straight line in each tile,

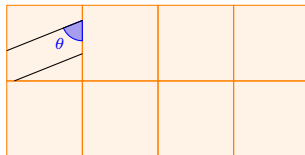


Definition of tiling billiards

Definition

A *tiling billiard* is a dynamical system whose trajectories are:

- in a polygonal tiling,
- in straight line in each tile,
- refracting when crossing a side.

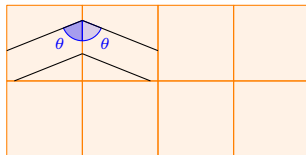


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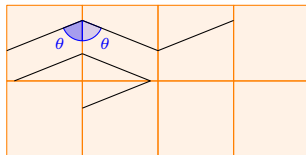


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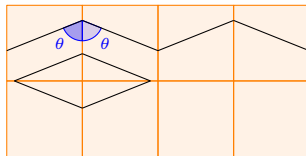


Definition of tiling billiards

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A *tiling billiard* is a dynamical system whose trajectories are:

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Triangle tiling billiards

Theorem (Baird-Smith, Davis, Fromm, Iyer and Hubert, Paris-Romaskevich)

For any triangle, for almost every initial direction, the trajectory is either periodic or at bounded distance from a line.

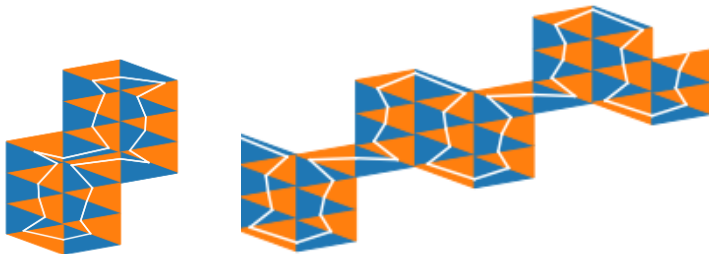


Figure: The two generic types of trajectories

Studying tiling billiards with Interval Exchange Transformations with Flips

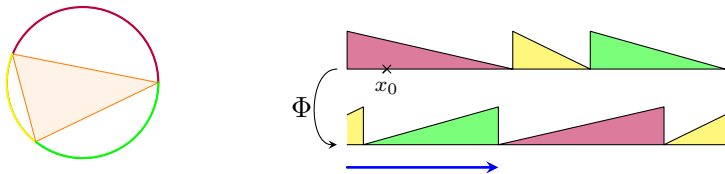


Figure: An IETF corresponding to a triangle tiling billiard.

A trajectory corresponds to the orbit of a point.

Studying tiling billiards with Interval Exchange Transformations with Flips

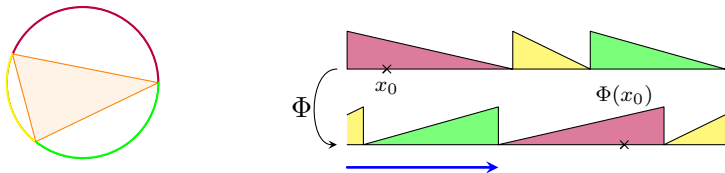


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Studying tiling billiards with Interval Exchange Transformations with Flips

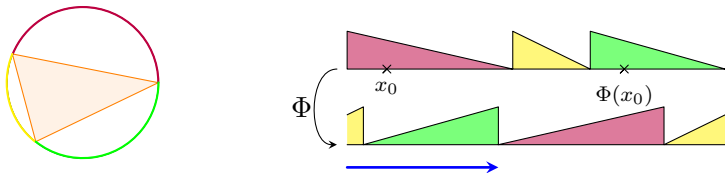


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Studying tiling billiards with Interval Exchange Transformations with Flips

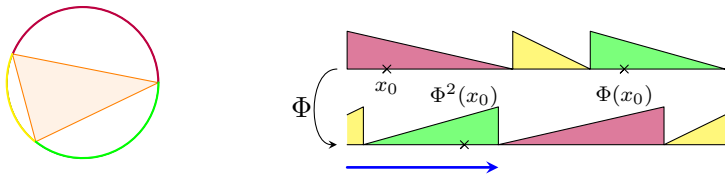


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Studying tiling billiards with Interval Exchange Transformations with Flips

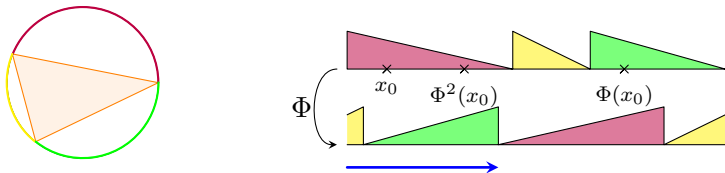


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Studying tiling billiards with Interval Exchange Transformations with Flips

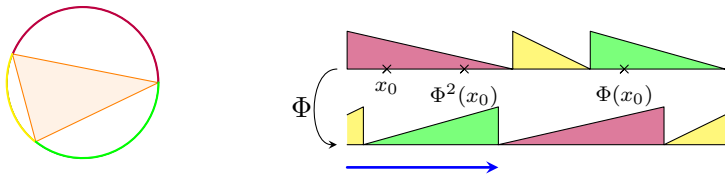


Figure: An IETF corresponding to a triangle tiling billiard.

A trajectory corresponds to the orbit of a point.

periodic trajectory \Rightarrow periodic orbit