ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

6. Topology

1991 MS Classification: 20, 51, 57

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Growth functions of tessellations.

Let X be a topological space tiled by a family $\mathcal{T} = (T_\lambda)_{\lambda\in\Lambda}$ of tiles, $\mu \in \Lambda$, $S_0 := \{T_\mu\}$. Define inductively shells around T_μ by $S_{m+1} := \{T_\lambda \,|\, T_\lambda \notin S_0 \cup \ldots \cup S_m \wedge T_\lambda \cap (\bigcup_{P\in S_m} P) \neq \emptyset\}$ for all $m \geq 0$. If all S_m are finite we can define the *growth series of* $(X, \mathcal{T})$ *around* T_μ by $f_{(X,\mathcal{T}),T_\mu}(x) := \sum_{m=0}^{\infty} \#S_m x^m \in \mathbb{Z}[[x]]$.

Tessellations of hyperbolic space coming from discrete subgroups of $\mathrm{Iso}(\mathbb{H}^2)$ and $\mathrm{Iso}(\mathbb{H}^3)$ have been looked at concerning their growth series. The growth series I have found are rational and I examined their symmetry and connection with the Euler characteristic.

The hyperbolic tessellations have been displayed by means of color plots and anaglyphs.

Reference: W. Floyd, and S. Plotnick, Growth functions on Fuchsian groups and the Euler characteristic, *Invent. math.* **88** (1987), 1–29.