

Cohomology of Tiling Spaces

Abstract: In recent years, cohomology groups have been associated with point patterns and tilings in an effort to better understand their statistical and geometrical properties. The most direct approach to defining these groups is through the pattern-equivariant de Rham theory developed by Kellendonk and his collaborators. This theory has been extended by Sadun to include arbitrary coefficient groups and is quite general. For point patterns and tilings that are generated by a substitution rule, however, there is a more computationally efficient alternative (based on the Anderson-Putnam-Gahler inverse limit construction and Čech cohomology) that also has the advantage of illuminating the geometrical meaning of some pieces of the cohomology. I will give an elementary presentation of this approach for substitution tilings of the real line and describe, by means of example, the construction in higher dimensions.