Colored Tessellations by NEC Polygonal Groups *

Domingo Gámez domingo@ugr.es Miguel Pasadas mpasadas@ugr.es Rafael Pérez rperez@ugr.es Ceferino Ruiz ruiz@ugr.es

Common address: Department of Mathematics University of Granada 18071 Granada, Spain

Abstract

A kaleidoscope is obtained as the quotient of a space by the own discontinuous action of a group of transformations; this can also be obtained from a fundamental domain, which characterizes it. In the present study, the specific case of the Hyperbolic Plane is analyzed with respect to the action of a hyperbolic polygonal group, which is a particular case of an NEC group. Under the action of these groups, the hyperbolic plane is tessellated using tassels with a polygonal shape. The reflections act upon them with respect to their sides as generators of the group. Clear examples of quadrilateral tessellations of the hyperbolic plane with the quadrilaterals of Saccheri and Lambert are given. We show tessellations of the Poincaré hyperbolic models created with the *Hyperbol* package for *Mathematica* software that it has been developed by the authors $(^1)$. They are found in the basic structure of the colored mosaics or tessellations of the hyperbolic plane.

^{*}Research partially supported by Grants of PAI: FQM-191 and FQM-803 $\,$

¹Software available at http://www.ugr.es/local/ruiz/software.htm