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Geometrical Characterization of q -Hyperelliptic Planar Klein Surfaces

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Abstract. A compact Klein surface X is a compact surface with a dianalytic structure. Such a surface can be seen as the quotient of the hyperbolic plane \mathbb{H}^2 under the action of a non-Euclidean crystallographic group (NEC group) Γ . The q -hyperelliptic Klein surfaces are characterized by the existence of an order two automorphism ϕ , called q -hyperelliptic involution, such that the quotient $X/\langle\phi\rangle$ has algebraic genus q . In this work, the geometry of the q -hyperelliptic involution is studied for planar surfaces. It is made by constructing fundamental regions that are right-angled hyperbolic polygons.

These polygons are also interesting in the study of the Teichmüller space of planar q -hyperelliptic Klein surfaces.

Keywords. Non-euclidean crystallographic groups, Klein surfaces, fundamental regions.

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