Classification of trees that inscribe hyperbolic ε-rectangles

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An hyperbolic ε-rectangle is an hyperbolic quadrilateral such that its diagonals share midpoint, the diagonals have the same hyperbolic length, and such that its inner angles sum up more than $2\pi - \varepsilon$ ($\varepsilon > 0$). A tree is a continuum which can be written as the union of finitely many arcs without simple closed curves. A continuum admits inscribed Euclidean rectangles if every copy of it, in $\mathbb{R}^2$, admits at least one inscribed rectangle (i.e. all vertices of a rectangle lie in the continuum's copy). In [1] authors classify locally connected continua that inscribe rectangles using the non-embeddability of the second symmetric products in $\mathbb{R}^3$ of certain continua. In this talk we classify trees that for every copy of the tree, T, in the hyperbolic plane, T admits an ε-rectangle inscribed, for every $\varepsilon > 0$. We do this using the non-embeddability of the second symmetric products of certain trees in $\mathbb{H} \times \mathbb{R}$.

References

[1] Morales-Fuentes, Ulises; Villanueva-Segovia, Cristina (2021), ”Rectangles Inscribed in Locally Connected Plane Continua”, Topology Proceedings, 58: 37–43.