Constant mean curvature surfaces in $\mathbb{H}^2 \times \mathbb{R}$ with boundary in two parallel planes

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Resumo/Abstract:
Given $H \in [0, \infty)$, some sufficient conditions for existence of CMC H graphs with boundary in two parallel planes of $\mathbb{H}^2 \times \mathbb{R}$ are presented. More precisely, we look for CMC graphs defined in an anular domain bounded by two Jordan curves in $\mathbb{H}^2 \times \{0\}$ such that one is contained in the region bounded by the other. With hypothesis that relate the mean curvature H, the distance h between the parallel planes, the geometry of the curves and the distance d between them, existence and non existence results for CMC surfaces with boundary consisting in one such curves in $\mathbb{H}^2 \times \{0\}$ and the vertical lifting of the other to $\mathbb{H}^2 \times \{h\}$ are presented.

In order to state and prove the theorems rotational surfaces and their properties are studied. Also, height estimates for outwards-oriented CMC surfaces (horo)cyllindrically bounded are obtained through the analysis of the *horonodoids* and *horocatenoids* which are CMC surfaces symmetric about a rotation centered at infinity. Some estimates are sharp since the rotational surfaces provide examples.

References

[1] P. Klaser, R. Soares, M. Telichevesky, *Constant mean curvature surfaces in* $\mathbb{H}^2 \times \mathbb{R}$ *with boundary in two parallel planes*, arXiv:1512.07637