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# FREE BOUNDARY MINIMAL SURFACES IN GEODESIC BALLS IN THE HYPERBOLIC SPACE AND THE UPPER HALF-SPHERE

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Recently, in [1] Lima and Menezes have found a connection between free boundary minimal immersions in geodesic balls in the spherical caps and maximal metrics for a functional on the set of Riemannian metrics on a given surface with boundary. In this talk I will explain how to extend their result to the case of free boundary minimal immersions in geodesic balls in the hyperbolic space and critical metrics for the high order generalization of the Lima-Menezes functional. Also, I plan to consider some applications to the area index of free boundary minimal surfaces in geodesic balls in the hyperbolic space and the upper half-sphere. This talk is based on my recent paper [2].

[1] V. Lima and A. Menezes. Eigenvalue problems and free boundary minimal surfaces in spherical caps. arXiv preprint arXiv:2307.13556, 2023.

[2] V. Medvedev. On free boundary minimal submanifolds in geodesic balls in  $H_n$  and  $S_n^+$ . arXiv preprint arXiv:2311.02409, 2023.