1026-52-182   **Daniel A. Klain*** (`dklain@cs.uml.edu`), Department of Mathematical Sciences, University of
Massachusetts Lowell, Lowell, MA 01854. *Isometry invariant valuations on hyperbolic space.*

Hyperbolic area is characterized as the unique continuous isometry-invariant simple valuation on convex polygons in the hyperbolic plane. It is also shown that continuous isometry-invariant simple valuations on polytopes in $(2n + 1)$-dimensional hyperbolic space for $n \geq 1$ are determined uniquely by their values at ideal simplices. The proofs exploit a connection between valuation theory in hyperbolic space and an analogous theory on the Euclidean sphere. These results lead to characterizations of continuous isometry-invariant valuations on convex polytopes and convex bodies in the hyperbolic plane, a partial characterization in hyperbolic 3-space, and a mechanism for deriving many fundamental theorems of hyperbolic integral geometry, including kinematic formulas, containment theorems, as well as isoperimetric and Bonnesen-type inequalities. (Received February 26, 2007)

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