

Addendum to Lecture 19: The hyperbolic Poincaré metrics

The Poincaré metrics for the unit disk and half – plane models of hyperbolic geometry are given as follows:

The unit disk model

$$\frac{4(dx dx + dy dy)}{(1 - (x^2 + y^2))^2}$$

The upper half – plane model

$$\frac{dx dx + dy dy}{y^2}$$

The two models are related by the transformation of the complex numbers sending a point z in the upper half – plane to the point w in the unit disk defined by

$$\frac{z - c}{z - c^*}$$

where c is an arbitrary point in the upper half – plane.