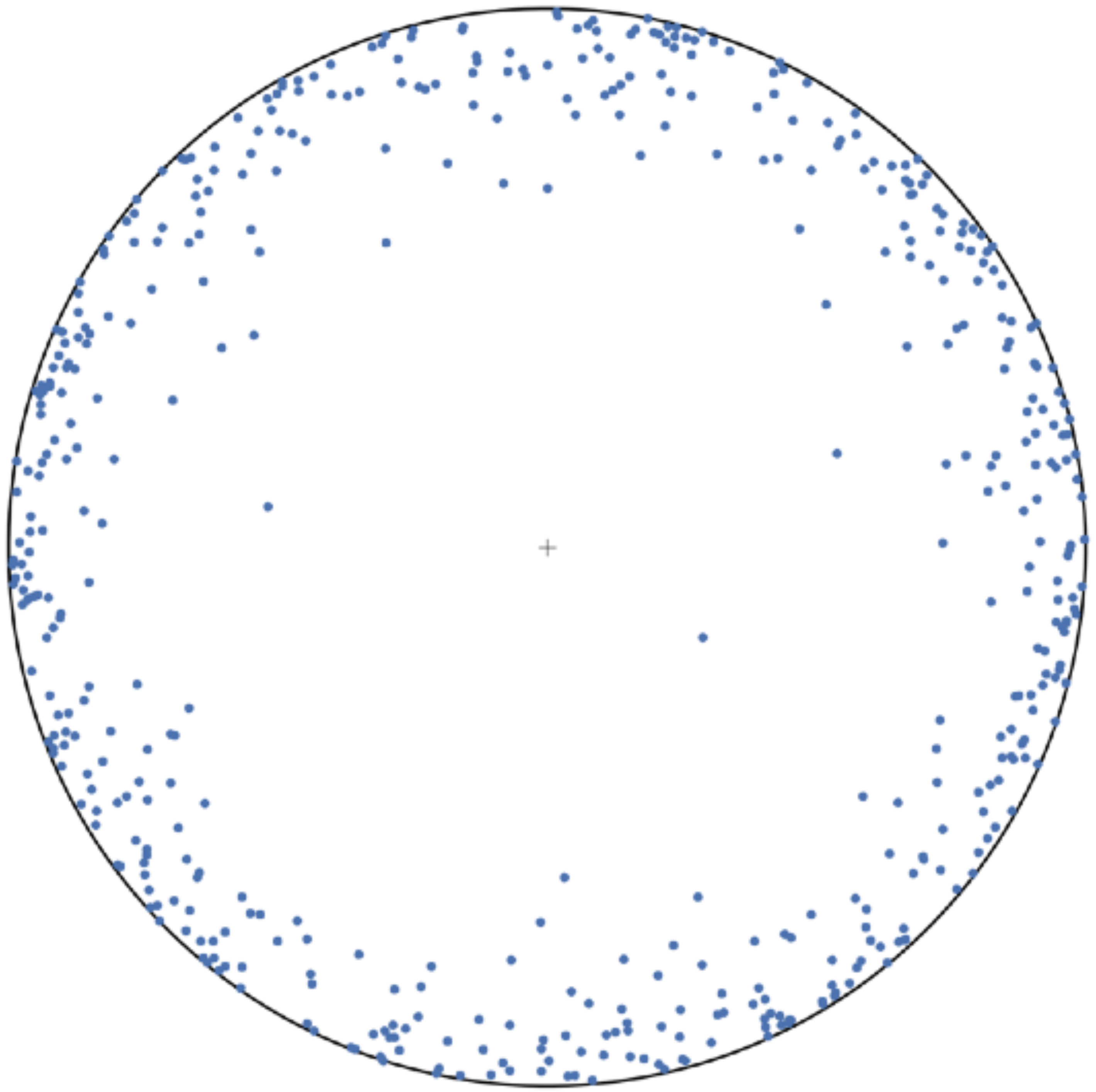
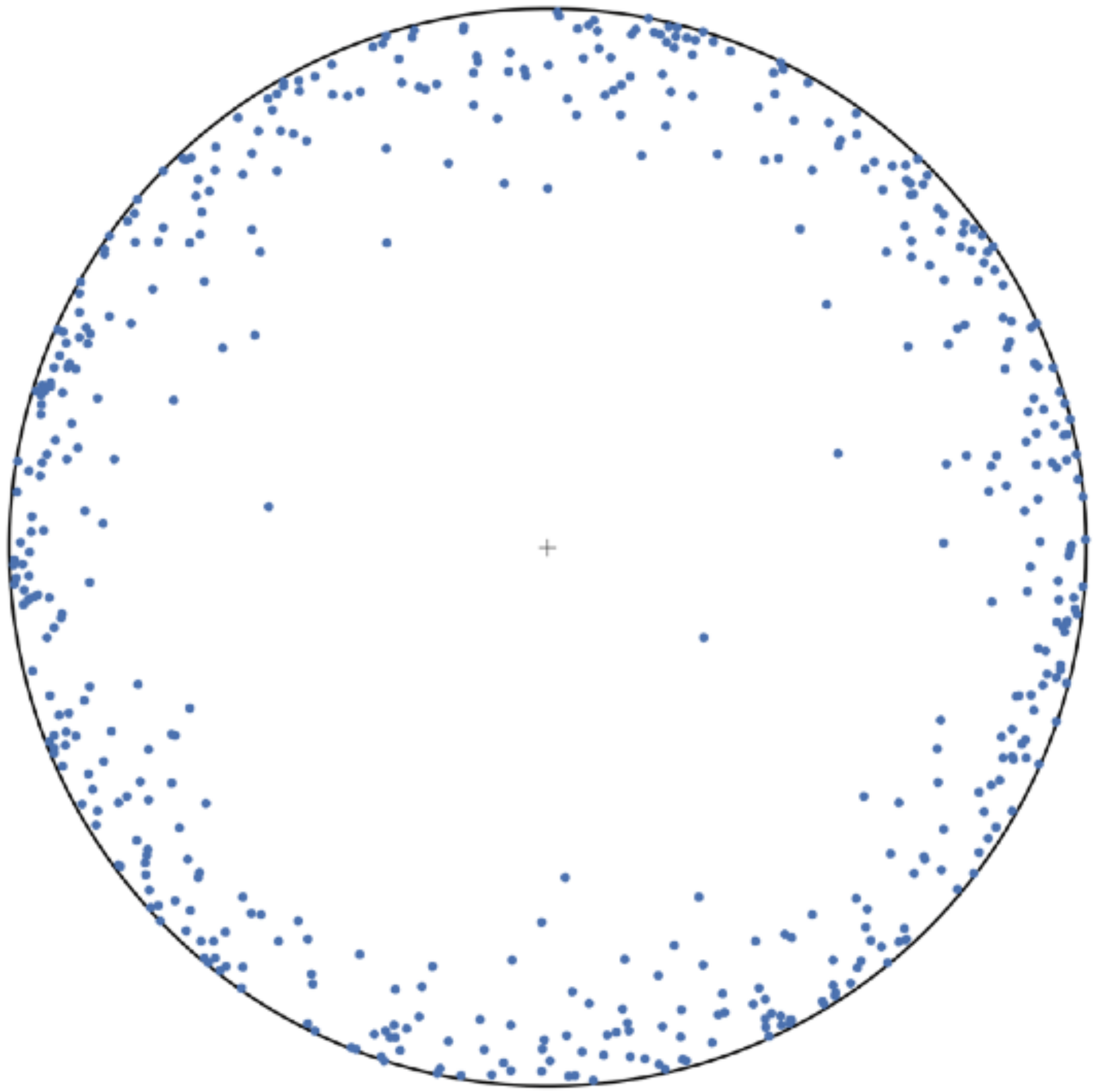
9

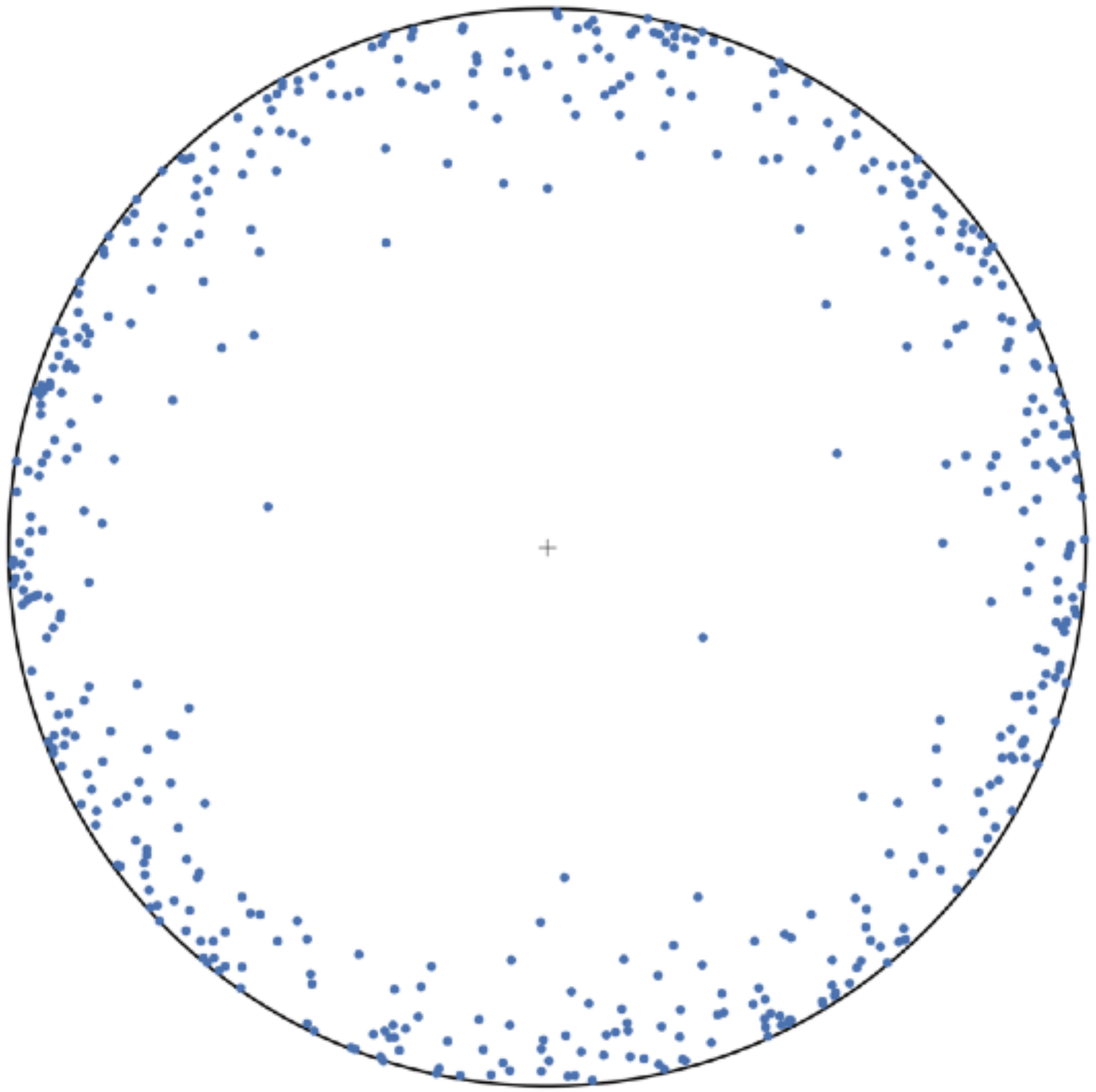
Hyperbolic geometry

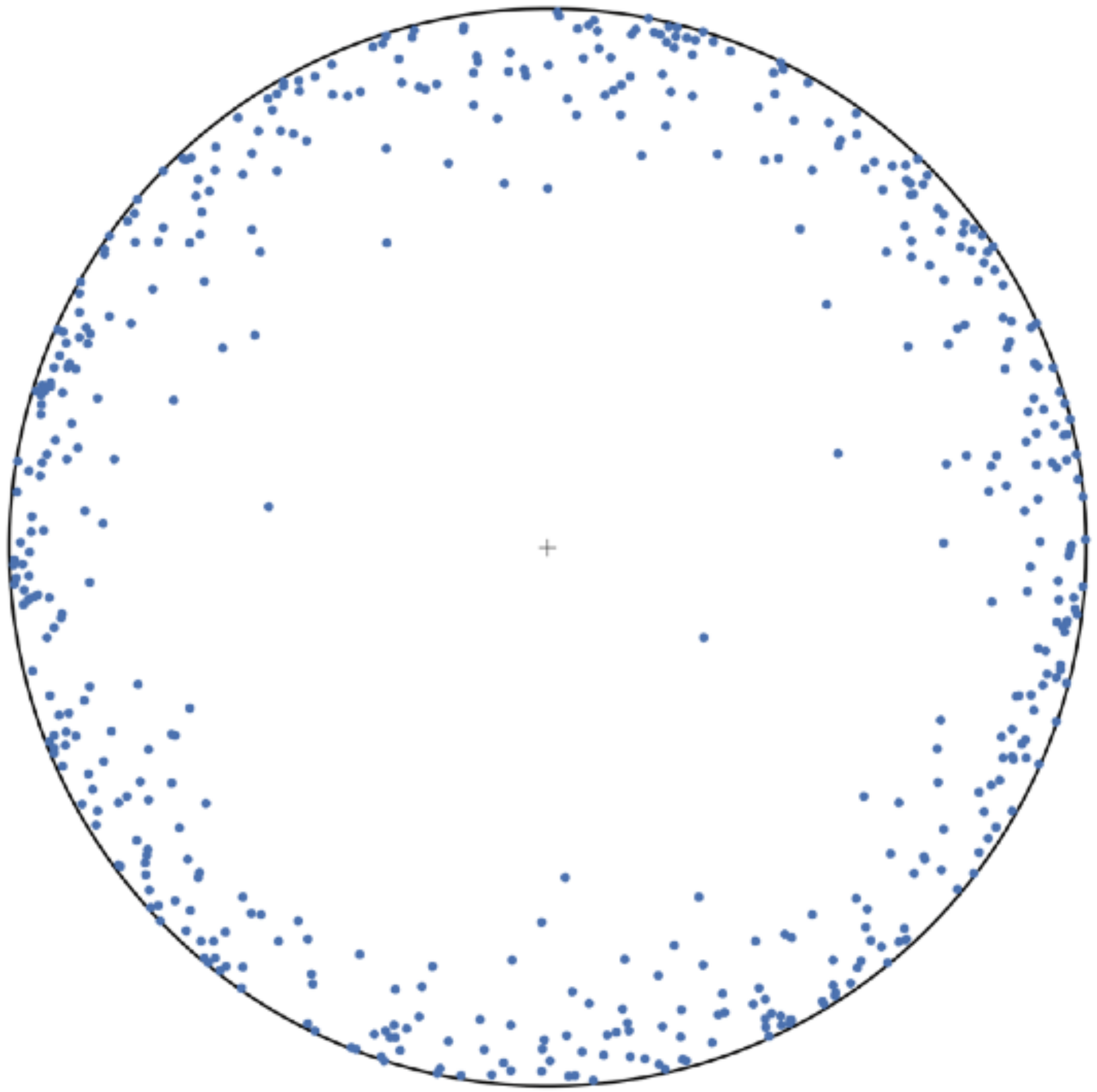
Simple random geometric graph

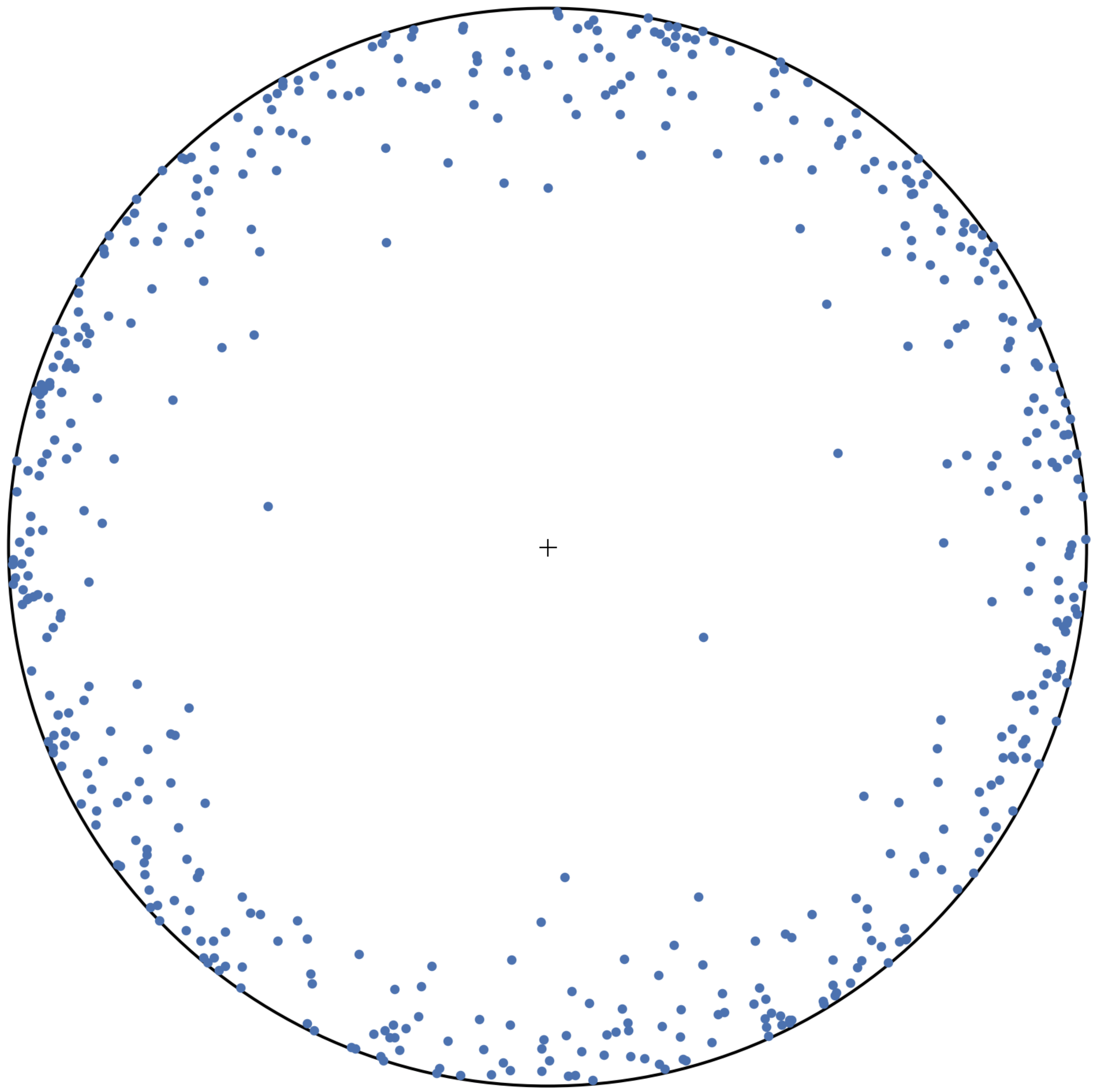
1. Sprinkle N nodes uniformly on the hyperbolic disk of radius R.
2. Connect any nodes separated by a distance less than $r = R$.

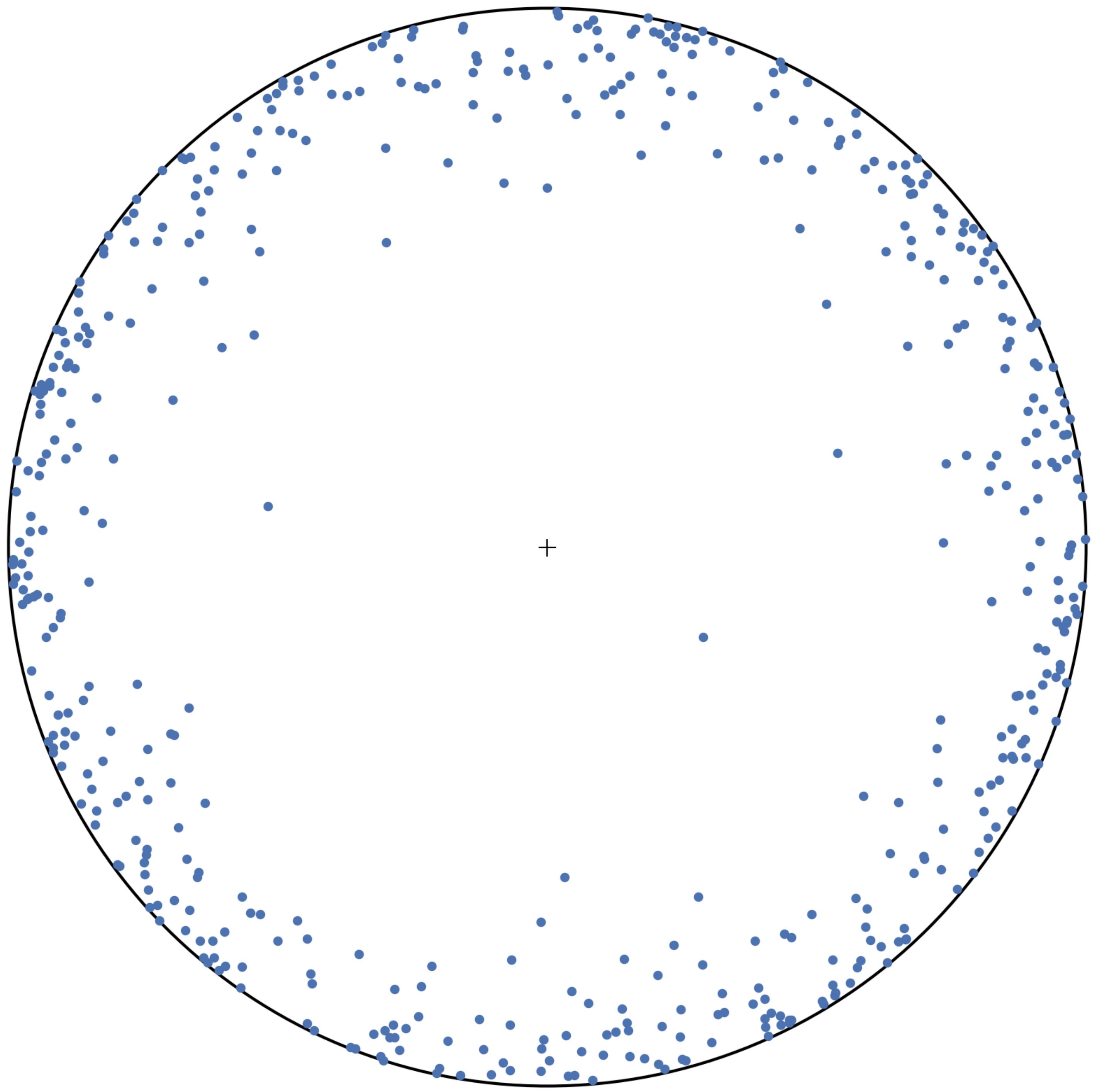
- ✓ high clustering
- ✓ power-law degree distribution with exponent -3

Phys. Rev. E 82, 036106 (2010)









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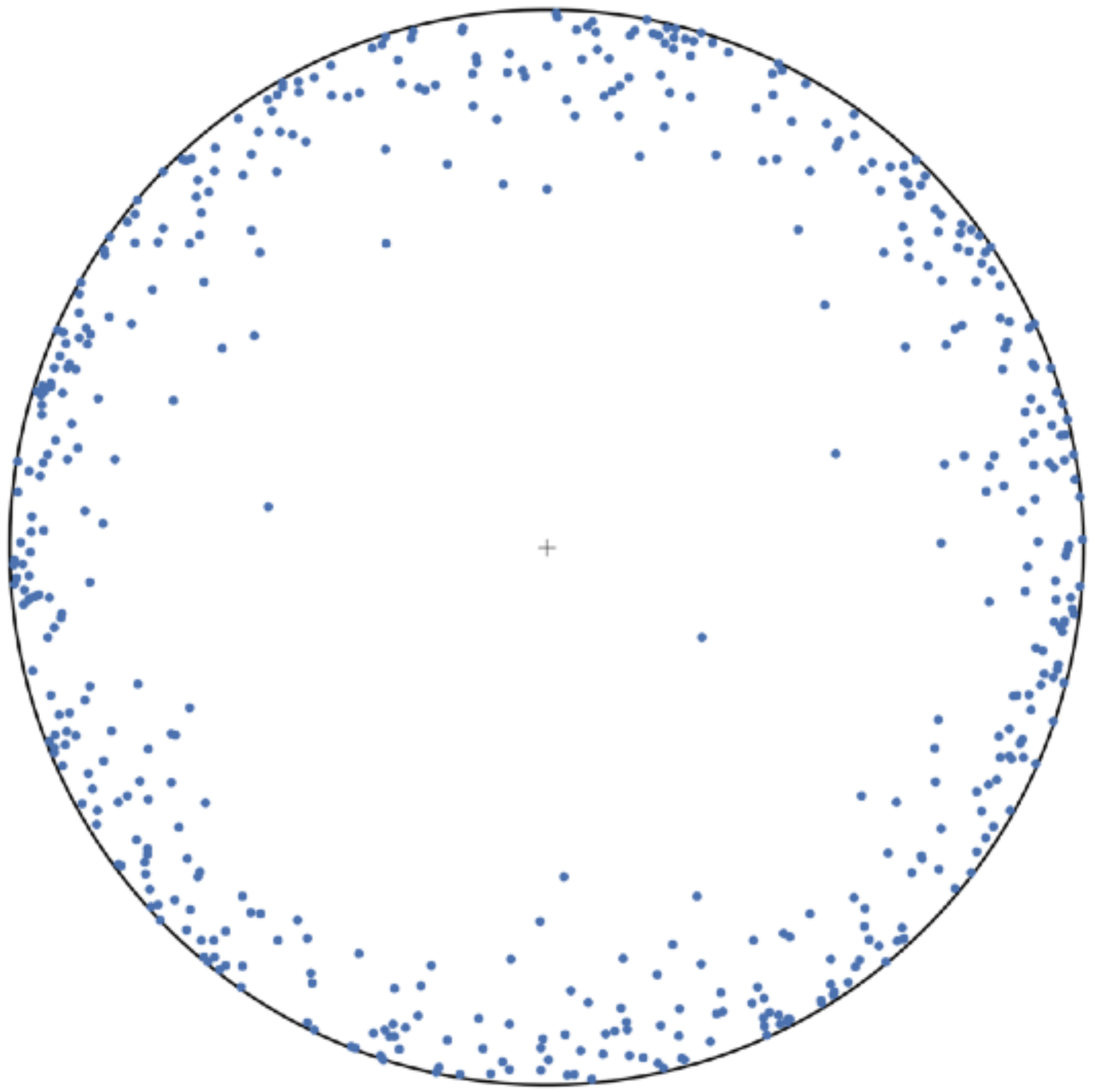

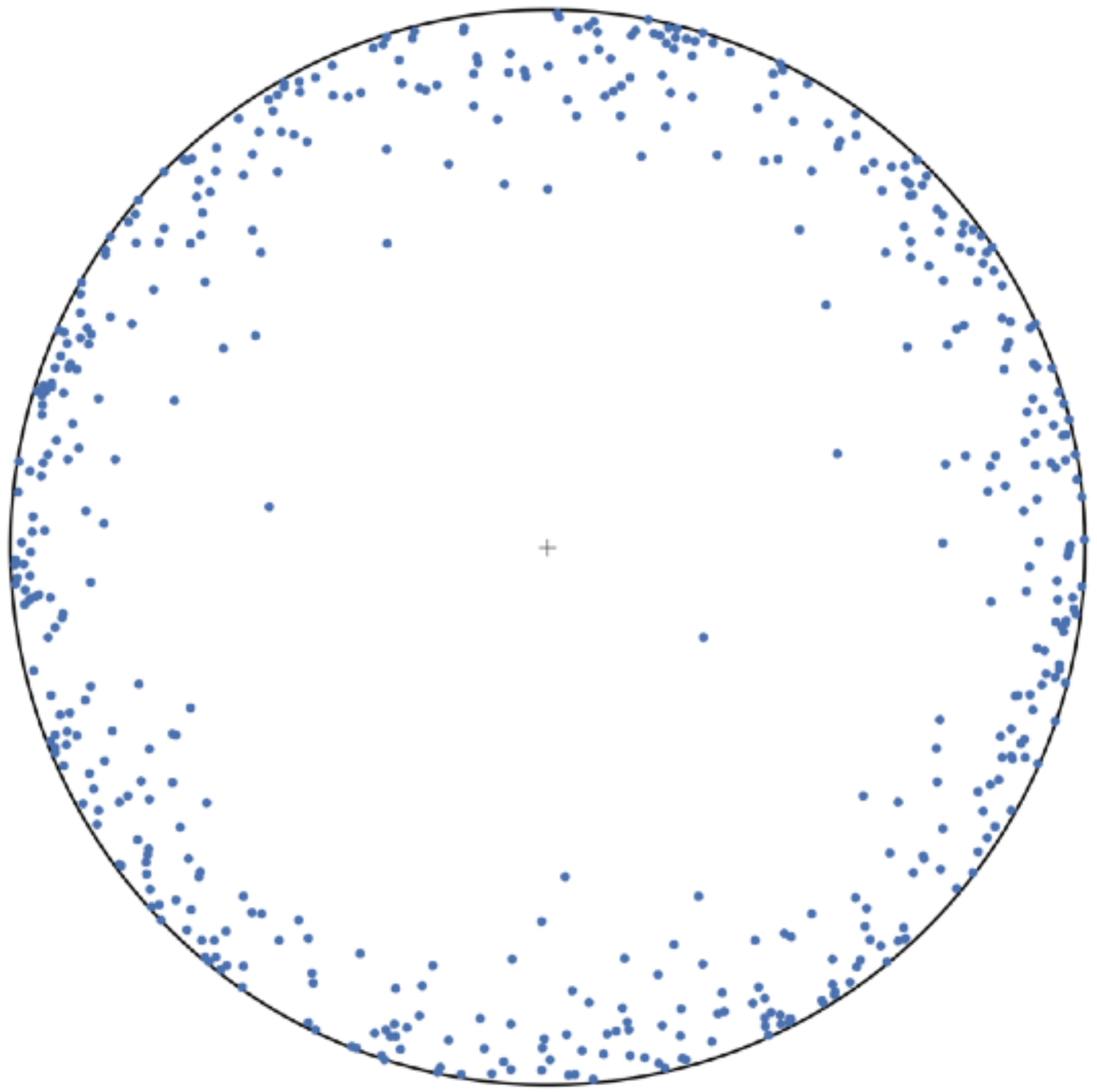

✓ high clustering

✓ power-law degree distribution with exponent -3

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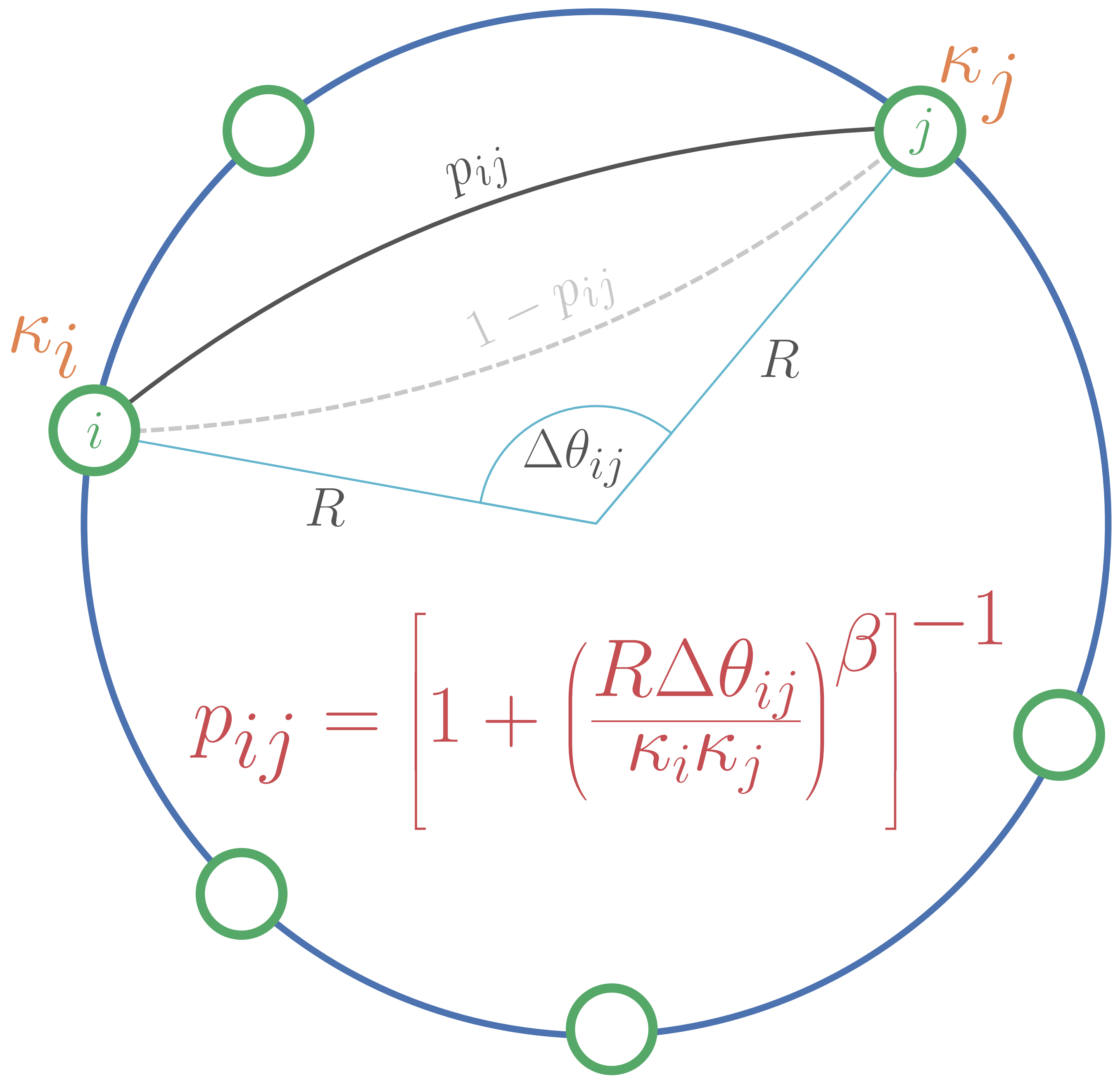
A geometric approach to clustering : the $\mathbb{S}^1/\mathbb{H}^2$ model



$$p_{ij} = \left[1 + \left(\frac{R\Delta\theta_{ij}}{\kappa_i\kappa_j}\right)^{\beta}\right]^{-1}$$

The $\mathbb{S}^1$ model

1. Sprinkle N nodes uniformly on a circle of radius R.
2. Assign an expected degree κ to each node according to some pdf $\rho(\kappa)$.
3. Draw a link between node i and node j with probability p_{ij}.

★ fixes the expected degree of nodes (κ) $\rightarrow$ soft configuration model (CM)
★ triangle inequality of the underlying metric space $\rightarrow$ triangles from pairwise interactions
★ level of clustering tuned with parameter β

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