

# ISOLATED AND EXTREME POINTS IN HYPERBOLIC RANDOM GEOMETRIC GRAPHS

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ABSTRACT. We consider the random geometric graph constructed on Poisson points in the Poincare disc of radius  $R$  and having curvature  $-\alpha^2$ . For  $\alpha \in (1/2, \infty)$  we establish expectation and variance asymptotics as well as asymptotic normality for the number of isolated and extreme points in the random geometric graph as  $R \rightarrow \infty$ . The limit theory and renormalization for the number of isolated points are highly sensitive on the curvature parameter. In particular, for  $\alpha \in (1/2, 1)$ , the variance is super-linear, for  $\alpha = 1$  the variance is linear with a logarithmic correction, whereas for  $\alpha \in (1, \infty)$  the variance is linear. The central limit theorem fails for  $\alpha \in (1/2, 1)$  but it holds for  $\alpha \in (1, \infty)$ . The talk is based on joint work with N. Fountoulakis.