1135-14-1725 **Desmond Coles*** (coles.69@buckeyemail.osu.edu), 2015 Summit Street, Columbus, OH 43201, and **Neelav Dutta**, **Sifan Jiang**, **Ralph Morrison** and **Andrew Scharf**. *Most Planar Graphs do not Admit Faithful Tropicalizations in the Plane.*

Let k be a nonarchimedean field, such as the p-adics. A powerful tool for studying an algebraic curve X over k is it's *minimal Berkovich skeleton* $\Gamma(X)$, a metric graph that encodes geometric information about X; such as the genus. To study $\Gamma(X)$, we use *tropical geometry*, which transforms X into a piecewise linear subset of $\mathbb{R}^n$, denoted $\text{Trop}(X)$. This set contains some subgraph of $\Gamma(X)$, and if it contains the entirety of $\Gamma(X)$, we call $\text{Trop}(X)$ *faithful*.

In 2015, Baker and Rabinoff proved that every curve has a faithful tropicalization in $\mathbb{R}^3$. The next question is: which curves have a faithful tropicalization in $\mathbb{R}^2$? In 2015, Brodsky, Joswig, Morrison and Sturmfels answered this question up to genus $g = 5$. We extend their results to genus 6, including the important case of smooth plane quintic curves, and prove an important restriction on such graphs: as g goes to infinity, the percentage of trivalent planar graphs with g loops that appear in a planar faithful tropicalization goes to zero. Our proof uses discrete combinatorial methods, including estimates of the number of triangulations of lattice polygons, combined with previous graph theoretical work. (Received September 25, 2017)