Graphs with girth $2\ell + 1$ and without longer odd holes are 3-colorable

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Abstract

For a number $\ell \geq 2$, let $\mathcal{G}_\ell$ denote the family of graphs which have girth $2\ell + 1$ and have no odd hole with length greater than $2\ell+1$. Plummer and Zha conjectured that every 3-connected and internally 4-connected graph in $\mathcal{G}_\in$ is 3-colorable. Wu, Xu, and Xu conjectured that every graph in $\bigcup_{\ell\geq 2} \mathcal{G}_\ell$ is 3-colorable. Chudnovsky et al. and Wu et al., respectively, proved that every graph in $\mathcal{G}_\in$ and $\mathcal{G}_\ni$ is 3-colorable. Recently, we prove that every graph in $\bigcup_{\ell\geq 5} \mathcal{G}_\ell$ is 3-colorable. In this talk, I will introduced some key ideas used to prove our result.

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