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Gaps in the cycle spectrum of polyhedral graphs

It was recently initiated by Merker to study whether every polyhedral graph must have a cycle length in some certain integer interval. For any positive integer k , define $f(k)$ (respectively, $f_3(k)$) to be the minimum integer $\geq k$ such that every 3-connected planar graph (respectively, 3-connected cubic planar graph) of circumference $\geq k$ has a cycle whose length is in the interval $[k, f(k)]$ (respectively, $[k, f_3(k)]$). We will describe how the values of $f(k)$ and $f_3(k)$ can be determined. This is a joint work with Qing Cui.