## The 2-surviving rate of $\boldsymbol{C}_{7}$-free planar graphs

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Let $G$ be a connected graph with $n \geq 2$ vertices. Let $k \geq l$ be an integer. Suppose that a fire breaks out at a vertex $v$ of $G$. A firefighter starts to protect vertices. At each step, the firefighter protects $k$-vertices that are not yet on fire. At the end of each step, the fire spreads to all unprotected vertices that have a neighbour on fire. Let $\operatorname{sn}_{k}(v)$ denote the maximum number of vertices of $G$ that the firefighter can save when a fire breaks out at $v$. The average $k$-surviving rate $\rho_{k}(G)=\sum_{v \in V(G)} S n_{k}(v) / n^{2}$. We shall discuss $\rho_{2}(G)$ in this talk where $G$ is a $C_{7}$-free planar graph.

Key word: planar graph, cycle free, fire control

