On the Dynamic Coloring of Graphs

Maryam Ghanbari

K. N. Toosi University of Technology
Iran

Let $G$ be a graph. A proper vertex coloring of $G$ is said to be a dynamic coloring if for every $v \in V(G)$ of degree at least 2, the neighbors of $v$ receive at least two different colors. The smallest integer $k$ such that $G$ has a dynamic $k$-coloring is called the dynamic chromatic number of $G$ and is denoted by $\chi_2(G)$. It was conjectured that if $G$ is an $r$-regular graph, then $\chi_2(G) - \chi(G) \leq 2$. In this talk, we show that the conjecture is true for all bipartite $r$-regular graphs. Also, we prove that if $G \not\in \{C_4, C_5, K_k,k\}$ is a strongly regular graph, then $\chi_2(G) - \chi(G) \leq 1$. Among the other results, it is shown that if $G$ is a graph with $\Delta(G) \geq 3$, then $ch_2(G) \leq \Delta(G) + 1$, where $ch_2(G)$ is the list dynamic chromatic number. This result is a generalization of a theorem due to Lai, Montgomery and Poon which says that if $G$ is a graph with $\Delta(G) \geq 3$, then $\chi_2(G) \leq \Delta(G) + 1$. 