On the Diameter of Unitary Cayley Graphs of Rings
Huadong Su

Abstract. The unitary Cayley graph of a ring $R$, denoted $\Gamma(R)$, is the simple graph defined on all elements of $R$, and where two vertices $x$ and $y$ are adjacent if and only if $x - y$ is a unit in $R$. The largest distance between all pairs of vertices of a graph $G$ is called the diameter of $G$, and is denoted by $\text{diam}(G)$. It is proved that for each integer $n \geq 1$, there exists a ring $R$ such that $\text{diam}(\Gamma(R)) = n$. We also show that $\text{diam}(\Gamma(R)) \in \{1, 2, 3, \infty\}$ for a ring $R$ with $R/J(R)$ self-injective and classify all those rings with $\text{diam}(\Gamma(R)) = 1, 2, 3$ and $\infty$, respectively. This extends [?, Theorem 3.1].