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CHARACTERIZATIONS OF t^2-REVERSIBLE RINGS

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Abstract: This article aims to investigate the ring theoretic structures of (strongly) t^2-reversible ring using the concept of non-zero tripotent elements. A ring R is said to be t^2-reversible if $ab = 0$ implies $bat^2 = 0$ for all $a, b \in R$ and t is a non-zero tripotent element of R. It is proved that R is a t^2-reversible ring if and only if t^2 is left semicentral and t^2Rt^2 is a reversible ring. We also introduce and establish several characteristics of strongly t^2-reversible rings. It is proved that every strongly t^2-reversible ring is also a t^2-reversible ring but the converse need not be true. Moreover we call, R is a right (left) t^2-reduced ring if $N(R)t^2 = 0$ ($t^2N(R) = 0$), where $N(R)$ stands for the set of all nilpotent elements of R and we have established some of its properties.

Keywords and Phrases: t^2-reversible rings, strongly t^2- reversible rings, t^2-reduced rings, tripotent elements.

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1. Introduction

All rings are associative with identity throughout this paper. Assuming that R is a ring, we denote its centre as $Z(R)$ and its set of all nilpotent elements as $N(R)$ respectively. Additionally, the $n \times n$ upper triangular matrix ring over R is denoted by the symbol $M_n(R)$. For a ring R, an element t is said to be tripotent if $t^3 = t$, the set of all non-zero tripotent elements is denoted by $T(R)$. It is obvious that all idempotents are tripotents but the converse is not true. For example let, $R =$