Characterizations of Jordan *- derivations and related maps in rings

SHAKIR ALI

Department of Mathematics
Aligarh Muslim University
Aligarh 202002, India
E-mail: shakir.ali.mm@amu.ac.in

ABSTRACT

Let R be a ring with involution $'*'$. An additive map $D : R \longrightarrow R$ is called a *-derivation (resp. *Jordan *-derivation*) if $D(xy) = D(x)y^* + xD(y)$(resp. $D(x^2) = D(x)x^* + xD(x)$) holds for all $x, y \in R$. A Jordan *-derivation D of R is called *inner* if there exists $a \in R$ such that $D_a(x) = xa - ax^*$ for all $x \in R$. The study of Jordan *-derivations was motivated by the problem of representability of quadratic forms by bilinear forms (see [Proc. Amer. Math. Soc. 100(1987), 133-136] for details). It turns out that the question of whether each quadratic forms can be represented by some bilinear form is intimated connected with the structure of Jordan *-derivations (viz., [Stud. Math. 97(1991), 157-165] and [Proc. Amer. Math. Soc. 119(1993), 1105-1113], where further reference can be found). In this talk, we will discuss the recent progress made on the topic and its related areas. (The first part of this talk is due to a joint work with M. Ashraf while the latter part is from a joint work with N. A. Dar).

2000 Mathematics Subject Classification: 16R60, 16N60, 16W10, 16R50

Keywords: prime ring, maximal symmetric ring of quotients, involution, Jordan *-derivation, Jordan triple * derivation, generalized Jordan $*$-derivation.