NonCommutative Rings and their Applications (NCRA IX)
30 June-3 July, 2025, Lens, France

S-Spectrum of A Noncommutative Ring

Eda Yıldız
Yildiz Technical University, edyildiz@yildiz.edu.tr

Abstract:

Let R be a ring (not necessarily to be commutative) with nonzero identity and S be an m-system of R. An ideal P of R with $P \cap S = \emptyset$ is called an S-prime right ideal if there exists an (fixed) $s \in S$ and whenever $aRb \subseteq P$ for $a, b \in R$ then either $a(s) \in P$ or $b(s) \in P$ where $(s) = RsR$. In this paper, we construct a topology on the set $Spec_S^r(R)$ of all S-prime right ideals of R which is generalization of prime spectrum of R. Also, we investigate the relations between algebraic properties of R and topological properties of $Spec_S^r(R)$ like compactness, connectedness and irreducibility.

Keywords: S-prime ideal, noncommutative ring, Zariski topology, spectrum

References

[1] Abouhalaka, A. (2024). S-Prime Ideals, S-Noetherian Noncommutative Rings, and the S-Cohen's Theorem. Mediterranean Journal of Mathematics, 21(2), 43.

[2] Hamed, A., Malek, A. (2020). S-prime ideals of a commutative ring. Beiträge zur Algebra und Geometrie/Contributions to Algebra and Geometry, 61(3), 533-542.

[3] McCoy, N. H. (1949). Prime ideals in general rings. American Journal of Mathematics, 71(4), 823-833.

[4] Yıldız, E., Ersoy, B. A., Tekir, Ü., Koç, S. (2021). On S-Zariski topology. Communications in Algebra, 49(3), 1212-1224.

[5] Zhang, G., Tong, W., Wang, F. (2006). Spectrum of a Noncommutative Ring. Communications in Algebra, 34(8), 2795–2810.