

GENERALIZATIONS OF REGULAR AND NORMAL SPACES II

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Abstract. A family m_X of subsets of a nonempty set X is called an m -structure [17]. A set X with a topology τ and m -structure m_X is called a mixed-space and is denoted by (X, τ, m_X) . As a generalization of g -closed sets due to Levine [10], we introduce the notion of m_g -closed sets in (X, τ, m_X) . By using m_g -open sets, we define and investigate mixed-regularity and mixed-normality in (X, τ, m_X) . As special cases, we obtain \mathcal{I}_g -regular spaces [13] and s -normal spaces [8].

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REFERENCES

- [1] A. Al-Omari and T. Noiri, *On operators in ideal minimal spaces*, *Mathematica*, **58** (81) (2016), 3–13.
- [2] A. Al-Omari and H. Al-saadi, *A topology via ω -local functions in ideal spaces*, *Mathematica*, **60** (83) (2018), 103–110.
- [3] A. Al-Omari and T. Noiri, *Generalizations of regular and normal spaces*, *Annales Univ. Sci. Budapest.*, **61** (2018), 121–135.
- [4] A. Al-Omari and T. Noiri, *Operators in minimal spaces with hereditary classes*, *Mathematica*, **61** (84) (2019), 101–110.
- [5] A. Al-Omari, H. Al-saadi and T. Noiri, *On extremally disconnected spaces via m -structures*, *Commun. Korean Math. Soc.*, **34** (2019), 351–359.
- [6] H. Al-Saadi and A. Al-Omari, *Some operators in ideal topological spaces*, *Missouri J. Math. Sci.*, **30** (2018), 59–71.
- [7] H. Al-saadi, A. Al-Omari and T. Noiri, *On hyperconnected spaces via m -structures*, *Ital. J. Pure Appl. Math.*, **42**, (2019), 290–300.
- [8] S.P. Arya and T.M. Nour, *Characterizations of s -normal spaces*, *Indian J. Pure Appl. Math.*, **21** (1990), 717–719.
- [9] N. Levine, *Semi-open sets and semi-continuity in topological spaces*, *Amer. Math. Monthly*, **70** (1963), 36–41.
- [10] N. Levine, *Generalized closed sets in topology*, *Rend. Circ. Mat. Palermo (2)*, **19** (1970), 89–96.
- [11] S.N. Maheshwari and R. Prasad, *On s -normal spaces*, *Bull. Math. Soc. Sci. Math. R. S. Roumanie*, **20(70)** (1978), 27–29.
- [12] H. Maki, K.C. Rao and A. Nagoor Gani, *On generalizing semi-open and preopen sets*, *Pure Appl. Math. Sci.*, **49** (1999), 17–29.

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- [13] M. Navaneethakrishnan, J. Paulraj Joseph and D. Sivaraj, *I_g -normal and I_g -regular spaces*, Acta Math. Hungar., **125** (2009), 327–340.
- [14] T. Noiri, *Almost α_g -closed functions and separation axioms*, Acta Math. Hungar., **82** (1999), 193–205.
- [15] T. Noiri, *A unified theory for modifications of g -closed sets*, Rend. Circ. Mat. Palermo (2), **56** (2007), 171–184.
- [16] T. Noiri, *A unified theory for certain modifications of generalized closed sets*, Int. J. Gen. Top., **1** (2008), 87–99.
- [17] V. Popa and T. Noiri, *On M -continuous functions*, An. Univ. “Dunărea de Jos” Galați, Ser. Mat. Fiz. Mec. Teor. (2), **43 (23)** (2000), 31–41.
- [18] J. Sanabria, E. Rosas, C. Carpintero and M. Salas-Brown, *On the further unified theory of ideal generalized closed sets*, J. Adv. Math. Stud., **4** (2011), 83–96.

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