

\*-TOPOLOGY AND #-TOPOLOGY

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**Abstract.** A new topology  $\tau^\#$  on  $X$ , via an ideal  $\mathcal{I}$ , is introduced and investigated.  $\tau^\#$  lies between  $\tau^\# \cap \tau$  and  $\tau^*$  properly, in general. Decompositions of  $*$ -continuity and  $\#_r$ -continuity are obtained – in particular, continuity and  $\delta$ -continuity.

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REFERENCES

- [1] ABD EL-MONSEF, M. E., EL-DEEB, S. N. and MAHMOUD, R. A.,  *$\beta$ -open sets and  $\beta$ -continuous mappings*, Bull. Fac. Sci. Assiut Univ., **12** (1983), 77–90.
- [2] D. ANDRIJEVIĆ, *On  $b$ -open sets*, Mat. Vesnik, **48** (1996), 59–64.
- [3] BALACHANDRAN, K., SUNDARAM, P. and MAKI, H., *On generalized continuous maps in topological spaces*, Mem. Fac. Sci. Kochi Univ. Ser. A Math., **12** (1991), 5–13.
- [4] CROSSLEY, C. G. and HILDEBRAND, S. K. *Semi-closure*, Texas J. Sci., **22** (1971), 99–112.
- [5] DONTCHEV, J., GANSTER, M. and NOIRI, T., *Unified operation approach of generalized closed sets via topological ideals*, Math. Japon., **49** (1999), 395–401.
- [6] DUSZYŃSKI, Z., *Optimality of mappings and some separation axioms*, Rend. Circolo Mat. Palermo, **57** (2008), 213–228.
- [7] GANSTER, M. and REILLY, I. L., *Locally closed sets and  $LC$ -continuous functions*, Internat. J. Math. Math. Sci., **3** (1989), 417–424.
- [8] HAMLETT, T. R. and ROSE, D.,  *$*$ -topological properties*, preprint.
- [9] HASHIMOTO, H., *On the  $*$  topology and its applications*, Fund. Math., **91** (1976), 5–10.
- [10] INTHUMATHI, V., KRISHNAPRAKASH, S. and RAJAMANI, M., *Strongly- $\mathcal{I}$ -locally closed sets and decompositions of  $*$ -continuity*, Acta Math. Hungar., **130** (2011), 358–362.
- [11] JANKOVIĆ, D. and HAMLETT, T. R., *New topologies from old via ideals*, Amer. Math. Monthly, **97** (1990), 295–310.
- [12] KESKIN, A., YUKSEL, S. and NOIRI, T., *Decompositions of  $I$ -continuity and continuity*, Commun. Fac. Sci. Univ. Ank. Sér. A1 Math. Stat., **53** (2004), 67–75.
- [13] KURATOWSKI, K., *Topology*, vol. **1**, Academic Press–PWN, New York–Warszawa, 1966.
- [14] LEVINE, N., *Semi-open sets and semi-continuity in topological spaces*, Amer. Math. Monthly, **70** (1963), 36–41.
- [15] LEVINE, N., *Generalized closed sets in topology*, Rend. Circ. Mat. Palermo, **19** (1970), 89–96.
- [16] MASHHOUR, A. S., ABD EL-MONSEF, M. E. and EL-DEEB, S. N., *On precontinuous and weak precontinuous mappings*, Proc. Math. and Phys. Soc. Egypt, **53** (1982), 47–53.
- [17] MURUGALINGAM, M., *A study of semi-generalized topology*, Ph.D. Thesis, Manonmanium Sundaranar Univ., 2005, Tirunelveli, Tamil Nadu, India.
- [18] NEVANEETHAKRISHNAN, M., *A study of ideal topological spaces*, Ph.D. Thesis, Manonmanium Sundaranar Univ., 2009, Tirunelveli, Tamil Nadu, India.
- [19] NJÅSTAD, O., *On some classes of nearly open sets*, Pacific J. Math., **15** (1965), 961–970.

- [20] NOIRI, T., *On  $\delta$ -continuous functions*, J. Korean Math. Soc., **16** (1980), 161–166.
- [21] NOIRI, T., *On  $\alpha$ -continuous functions*, Čas. pěst. mat., **109** (1984), 118–126.
- [22] NOIRI, T. and POPA, V., *Between  $*$ -closed sets and  $\mathcal{J}$ - $g$ -closed sets in ideal topological spaces*, Rend. Circ. Mat. Palermo, **59** (2010), 251–260.
- [23] PALANIAPPAN, N., and CHANDRASEKHARA RAO, K., *Regular generalized closed sets*, Kyungpook Math. J., **33** (1993), 211–219.
- [24] POPA, V. and NOIRI, T., *On  $\mathcal{M}$ -continuous functions*, Anal. Univ. “Dunarea de Jos” Galați, Ser. Mat. Fiz. Mec. Teor., Fasc. II, **18**(23) (2000), 31–41.
- [25] SUNDARAM, P. and SHEIK JOHN, M., *Weakly closed sets and weakly continuous maps in topological spaces*, Proc. 82nd Indian Science Congress, Calcutta, **49** (1995).
- [26] VAIDYANATHASWAMY, R., *The localization theory in set-topology*, Proc. Indian Acad. Soc., **20** (1945), 51–61.
- [27] VAIDYANATHASWAMY, R., *Set topology*, Chelsea, New York, 1960.
- [28] VEERA KUMAR, M. K. R. S., *On  $\hat{g}$ -closed sets in topological spaces*, Bull. Allahabad Math. Soc., **18** (2003), 99–112.
- [29] VELIČKO, N. V., *H-closed topological spaces* (in Russian), Mat. Sb., **70**(112) (1966), 98–112.

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