

## ON $nd$ - $K^*(n, r)$ -FULL HYPERSUBSTITUTIONS

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### Abstract

Based on the notion of  $K^*(n, r)$ -full terms defined by the authors,  $nd$ - $K^*(n, r)$ -full hypersubstitutions are defined. It turns out that the extension of an  $nd$ - $K^*(n, r)$ -full hypersubstitution is an endomorphism of the algebra of tree languages of  $nd$ - $K^*(n, r)$ -full terms.

**Keywords:**  $K^*(n, r)$ -full term,  $nd$ - $K^*(n, r)$ -full hypersubstitution, full term,  $nd$ -full hypersubstitution.

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### REFERENCES

- [1] K. Denecke and N. Sarasit, *Products of tree languages*, Bulletin of the Section of Logic **40** (2011) 13–36.
- [2] K. Denecke and N. Sarasit, *Semigroups of tree languages*, Asian-Eur. J. Math. **1** (2008) 489–507.  
<https://doi.org/10.1142/S1793557108000400>
- [3] K. Denecke, P. Glubudom, and J. Koppitz, *Power clones and non-deterministic hypersubstitutions*, Asian-Eur. J. Math. **1** (2008) 177–188.  
<https://doi.org/10.1142/S1793557108000175>

- [4] S. Lekkoksung, *Monoids of  $nd$ -full hypersubstitutions*, Discuss. Math. Gen. Alg. Appl. **39** (2019) 165–179.  
<https://doi.org/10.7151/dmgaa.1314>
- [5] K. Wattanatripop and T. Changphas, *The clone of  $K^*(n, r)$ -full terms*, Discuss. Math. Gen. Alg. Appl. **39** (2019) 277–288.  
<https://doi.org/10.7151/dmgaa.1319>

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