MR2372751 (2009b:03108) 03D05 (03B44 68Q45 68Q70)

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Some varieties of finite tree automata related to restricted temporal logics. (English summary)

Fund. Inform. **82** (2008), *no. 1-2,* 79–103.

The present paper and its prequel [Fund. Inform. **82** (2008), no. 1-2, 61–78; MR2372750 (2009b:03107)] constitute a continuation and generalization of the first author's earlier research published in a series of three papers [in *Proceedings of the 1st International Conference on Algebraic Informatics*, 53–77, Aristotle Univ. Thessaloniki, Thessaloniki, 2005; MR2186455 (2006j:03018); ibid., 79–99; MR2186456 (2006j:03019); ibid., 101–110; MR2186457 (2006j:03017)]. In the earlier papers varieties of tree automata which were closed under the cascade products (of algebras) were linked, via a type of Eilenberg Variety Theorem, to the families of tree languages which were definable by some modal (and other natural) operations. The closure of the tree automata varieties under the cascade products forced the modal operations to express the *next* modality, and the families of tree languages to contain the variety $\mathcal{D}$ of definite tree languages.

In these two papers, the authors relax the constraint of being closed under the cascade products (of the tree automata varieties) to being closed under the so-called Moore products. The closure of the tree automata varieties under the Moore products does not force anything on the expressive power of the modal operations, but still the families of tree languages have to contain the variety $\mathcal{D}_1$ of 1-definite tree languages.

In this second paper some concrete Moore varieties of tree automata are deeply studied, and some effective characterizations for certain fragments of CTL-definable tree languages are given.

Reviewed by *Saeed Salehi*