On formulas in one variable and logics determined by wheel frames in NEXT(**KTB**)

Zofia Kostrzycka

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University of Technology
Luboszycka 3, 45-036 Opole, Poland
E-mail z.kostrzycka@po.opole.pl

In this paper we investigate normal modal logics over $\mathbf{T_2} = \mathbf{KTB} \oplus \Box^2 p \to \Box^3 p$ logic. Although the $\mathbf{T_2}$ logic is characterized by the class of reflexive symmetric and two-step transitive frames, there is very few results concerning it.
Yutaka Miyazaki in [2] considered logics determined by the so-called wheel frames. On the base of these frames and by using the splitting technique effectively, he constructed a continuum of normal modal logics over $\mathbf{T_2}$ logic.
In this paper we characterize the wheel frames by formulas written in one variable. On this purpose we take advantage of the infinite sequence of non-equivalent formulas in one variable from [2].

Theorem 1. *There is a continuum of normal modal logics over* $\mathbf{T_2}$ *logic defined by formulas in one variable.*

We also characterize the connection between the notion of diameter of a frame with a tail, and locally tabular members in $NEXT(\mathbf{T_2})$.

Theorem 2. *Let* $L \in NEXT(\mathbf{T_2})$ *logic and* L *is characterized by frames with a tail. Then:*
L *is locally tabular iff* L *has a finite diameter.*

References:

[1] Kostrzycka Z., *On formulas in one variable in* $NEXT(KTB)$, Bulletin of the Section of Logic, Vol.35:2/3, (2006), 119-131.

[2] Miyazaki Y. *Normal modal logics containing KTB with some finiteness conditions*, Advances in Modal Logic, Vol.5, (2005), 171-190.