

- ▶ ANAHIT CHUBARYAN, GARIK PETROSYAN, SERGEY SAYADYAN, *Monotonous and strong monotonous properties of some propositional proof systems for Classical and Non Classical Logics.*

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For some propositional proof system of classical and non-classical logics we investigate the relations between the lines (*t-complexities*) and sizes (*l-complexities*) of proofs for minimal tautologies, which are not a substitution of a shorter tautology of this logic, and results of a substitutions in them. For every minimal tautology  $\varphi$  of fixed logic by  $S(\varphi)$  is denoted the set of all tautologies, which are results a substitution in  $\varphi$ .

**Definition 1.** The proof system  $\Phi$  is called *t-monotonous* (*l-monotonous*), if for every minimal tautology  $\varphi$  of this system and for every formula  $\psi$  from  $S(\varphi)$   $t^\Phi(\varphi) \leq t^\Phi(\psi)$  ( $l^\Phi(\varphi) \leq l^\Phi(\psi)$ ).

**Definition 2.** The proof system  $\Phi$  is called *t-strong monotonous* (*l-strong monotonous*), if for every non-minimal tautology  $\psi$  of this system there is such minimal tautology  $\varphi$  of this system such that  $\psi$  belong to  $S(\varphi)$  and  $t^\Phi(\psi) \leq t^\Phi(\varphi)$  ( $l^\Phi(\psi) \leq l^\Phi(\varphi)$ ).

Formerly it is proved in [1], that Frege systems for classical and non-classical logics are neither *t-monotonous* nor *l-monotonous*.

Now we consider the following systems: propositional resolution systems *RC, RI, RJ* for classical, intuitionistic and Johanssons logics accordingly, eliminations systems *E, EI, EJ*, based on the determinative normal forms for the same logics [2], and the system *GS*, based on generalization of splitting method [3].

**Theorem 1.** *The systems RC, RI and RJ are t-strong monotonous (l-strong monotonous), but neither of them is t-monotonous (l-monotonous).*

**Theorem 2.** *Each of the systems EC, EI, EJ and GS is neither t-monotonous (l-monotonous) nor t-strong monotonous (l-strong monotonous).*

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