

- ▶ ANAHIT CHUBARYAN, GARIK PETROSYAN, *The proof complexities relations for strongly equal classical tautologies in Frege systems.*

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The traditional assumption that all tautologies as Boolean functions are equal to each other is not fine-grained enough to support a sharp distinction among tautologies. The authors of [1] have introduced the notion of determinative conjunct, on the basis of which the notion of strong equality of classical tautologies was suggested. The idea to revise the notion of equivalence between tautologies in such way that it takes into account an appropriate measure of their complexity. The relations between the proof complexities of strongly equal classical tautologies in some weak proof systems are investigated in [2]. It was proved that in these proof systems the strongly equal tautologies have the same proof complexities.

In this paper the relations between the four main measures of proof complexities (length, size, space and width) for strongly equal tautologies are investigated in the most traditional proof systems of Classical Logic - Frege systems. We show that there is the sequence of tautology pairs φ_n and ψ_n such, that for every n φ_n and ψ_n are strongly equal, the main measures of proof complexities in Frege systems for φ_n are bounded by polynomial function in size of φ_n just as the lower bounds for the same measures of ψ_n are exponential function in size of φ_n .

[1] AN. CHUBARYAN, ARM. CHUBARYAN, *A new conception of Equality of Tautologies*, ***L&PS, Triest, Italy***, Vol. V, No 1, 2007, pp. 3-8.

[2] AN. CHUBARYAN, ARM. CHUBARYAN, A. MNATSAKANYAN, *Proof complexities of strong equal classical tautologies in some proof systems*, ***Nauka i studia, Poland***, 42(110), 2013, pp. 91-98.