

Reference Letter on the paper

DEFINABILITY IN LOGICS WITH STRONG
NEGATION by

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This paper considers logics with strong negation from the point of view of abstract algebraic logic. Author fixes distinction among sn-implicative logics and shows that for bl-logics weak definitional equivalence implies definitional equivalence. For examples of weakly definitional equivalent logics author considers Nelson's constructive logic $N4-$ and Wansing's connexive logic $C-$. The paper shows that all implicative logics satisfying the deduction theorem possess the Beth property B2 and that all explosive sn-implicative logics satisfying the deduction theorem possess an analog of Beth property adopted to the language with strong negation.

Overall, the paper is a solid and well written manuscript, containing new important results.

Section 1 recalls basic notions and results from algebraic logic and prepare technique necessary for reading the paper.

Section 2 works with the notion of an implicative logic with strong negation (sn-implicative logic). That might be seen an abstract notion of a logic with strong negation. In some point here, the author define the notion of a weak definitional equivalence of logics, which is based on that.

Section 3 includes examples of weakly definitional equivalent logics. here it is shown that Nelson's constructive logic $N4-$ and Wansing's connexive logic $C-$ are weakly definitional equivalent. Also it is shown that all implicative logics satisfying the deduction theorem possess B2 and that all explosive sn-implicative logics satisfying the deduction theorem possess an analog of Beth property adopted to the language with strong negation.

Section 4 studies Beth property in implicative logics with strong negation. Author tells that

{it W.E. Beth proved that in classical predicate logic the implicit definability of a predicate by a theory implies that this theory defines the predicate explicitly too. Since that studying interrelations between different forms of definability became an important branch of investigations in non-classical logics. }

Based on this base here it is proved that all implicative logics satisfying the deduction theorem possess the Beth property B2 and that all explosive sn-implicative logics satisfying the deduction theorem possess an analog of Beth property adopted to the language with strong negation.

To conclude overall --

The paper is well written and gives a good chance to the reader to follow closely the presentation. The paper is reasonably long and some proofs are complicated, I've been not able to verify all presented proofs, but all which I had hance to look through are correct. The paper is a good contribution to the area and I recommend to publish it.

The REVIEWER