Non-modal propositional languages on transitive frames and their embeddings

Yasuhito Suzuki
School of Information Science,
Japan Advanced Instituite Science and Technology

March 23,1999

Abstract

This thesis reveals that many properties of the non-modal propositional language $\mathcal{L}$ and logics on $\mathcal{L}$ which is interpreted on transitive frames.

We can find that there are many unexpected phenomena in $\mathcal{L}$ and these logics on transitive frames as compared with them on quasi-ordered frames. There are no differences as for the properties of their model theory, for instance, the duality theorem holds, generated subframes and homomorphisms preserve validity from their original structures. However, by lacking reflexivity, it is showed that the expressive powers of $\mathcal{L}$ are weaker than that of modal propositional language, and an induced conseqeuce relation of some logics (for instnace, basic propositional logic **BPL**) does not satisfy the deduction theorem, etc. We gave one reason to define extensions on **BPL** not only as a formula-extension but also as a rule-extension, and discussed their model theory. We also indicate that these differences disappear by adding a new implication to $\mathcal{L}$.

Key Words: **Intuitionistic logic, basic logic, modal logic, duality, Kripke frame**