Long D-normal Form Yields Uniqueness of Proofs

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There have been much interest in the conditions for uniqueness of normal form proofs in intuitionistic logic. [Tatsuta99] introduced a notion of D-normal form proof and showed that D-normal form proof is unique for any implicational formula. But this result means the uniqueness of D-normal form proof. There may be some other normal form proof which is not D-normal. We show that D-normality yields the uniqueness of proofs as long as the long-normal form proofs are concerned.

For a formula, $core(A)$ is the rightmost variable in A. A normal form proof is D-normal if $core(A) \neq core(B)$ for any initial sequent $\Gamma, A, B \vdash A$.

Theorem If a formula A has a long D-normal form proof , then long normal form of A is unique.

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[Tatsuta93] M. Tatsuta, Uniqueness of normal form proofs of minimal formulas, Journal of Symbolic Logic 58 (3), 789–799, 1993

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