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Monotone sequent calculus and resolution

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Abstract: We study relations between propositional Monotone Sequent Calculus (MLK — also known as Geometric Logic) and Resolution with respect to the complexity of proofs, namely to the concept of the polynomial simulation of proofs. We consider Resolution on sets of monochromatic clauses. We prove that there exists a polynomial simulation of proofs in MLK by intuitionistic proofs. We show a polynomial simulation between proofs from axioms in MLK and corresponding proofs of contradiction (refutations) in MLK. Then we show a relation between a resolution refutation of a set of monochromatic clauses (CNF formula) and a proof of the sequent (representing corresponding DNF formula) in MLK. Because monotone logic is a part of intuitionistic logic, results are relevant for intuitionistic logic too.

Keywords: intuitionistic propositional logic, monotone logic, sequent calculus, resolution, complexity of proofs

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