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## NOTE

### COMMENTS ON "TAUTOLOGY TESTING WITH A GENERALIZED MATRIX REDUCTION METHOD"

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Bibel [1] has given a proof system for the propositional calculus called (generalized) matrix reduction. When matrix splitting is restricted to one literal at a time the system is the same as Galil's system [2] of enumeration dags. In fact the relation is even closer. The matrices produced by the reduction on a set of literals  $\{I\}$  are exactly the set of clauses appearing on a dag after  $|I|$  consecutive branches which substitute for the same literals. The clauses  $M_1$  (which do not appear in the matrices  $M^c$ ) are exactly the clauses whose branches close with the empty clause  $\Lambda$ . Thus the saving in space is at most by a factor of  $|I|$ , but  $|I|$  is bounded from above by  $\log_2 M$  to 'guarantee polynomial behaviour'. Hence Galil's system polynomially simulates matrix reduction and thus matrix reduction is also an exponential proof procedure.

## References

- [1] W. Bibel, Tautology testing with a generalized matrix reduction method, *Theoret. Comput. Sci.* **8** (1979) 31–44.
- [2] Z. Galil, On enumeration procedures for theorem proving and for integer programming, in: S. Michaelson and R. Milner, Eds., *Automata, Languages and Programming*, Edinburgh (1976) 355–381.