

## Problem #105 (Solved !)

*Originator: Johannes Waldmann (Talk at RTA'06)*

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*Summary: Derivational complexity of replacing two successive occurrences of the same symbol in a string*

The following string rewrite system is known to be terminating [HW05], see Problem 104.

$$aa \rightarrow bc$$

$$bb \rightarrow ac$$

$$cc \rightarrow ab$$

Is the derivational complexity polynomially bounded? (It is at least quadratic.).

### Remark

There is a quadratic bound on the length of derivation sequences [Adi09].

# Bibliography

- [Adi09] Sergei Adian. Upper bound on the derivational complexity in some word rewriting system. *Doklady Mathematics*, 80(2):679–683, October 2009.
- [HW05] Dieter Hofbauer and Johannes Waldmann. Termination of  $\{aa \rightarrow bc, bb \rightarrow ac, cc \rightarrow ab\}$ . Preprint, 2005.