

# Timing-Constrained Replacement Using Spare Cells for Design Changes

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## Abstract

Spare cells have been widely used to realize design changes at post-placement stage for functional changes or timing violations. However, many prior works relative to spare cell utilization neglect the timing effect due to spare cell rewiring. In this paper, the problem of timing-constrained cell replacement using spare cells is firstly formulated to consider the timing effect of the rewiring result. Furthermore, a three-phase approach is proposed to replace the changed cells in a combinational circuit with available spare cells while the timing constraints on the changed cells are satisfied. Experimental results show that our approach can efficiently realize functional changes under the timing constraints for 5 tested cases.

Keyword : Sparse cell, ECO