

Figure 1: timing-pattern

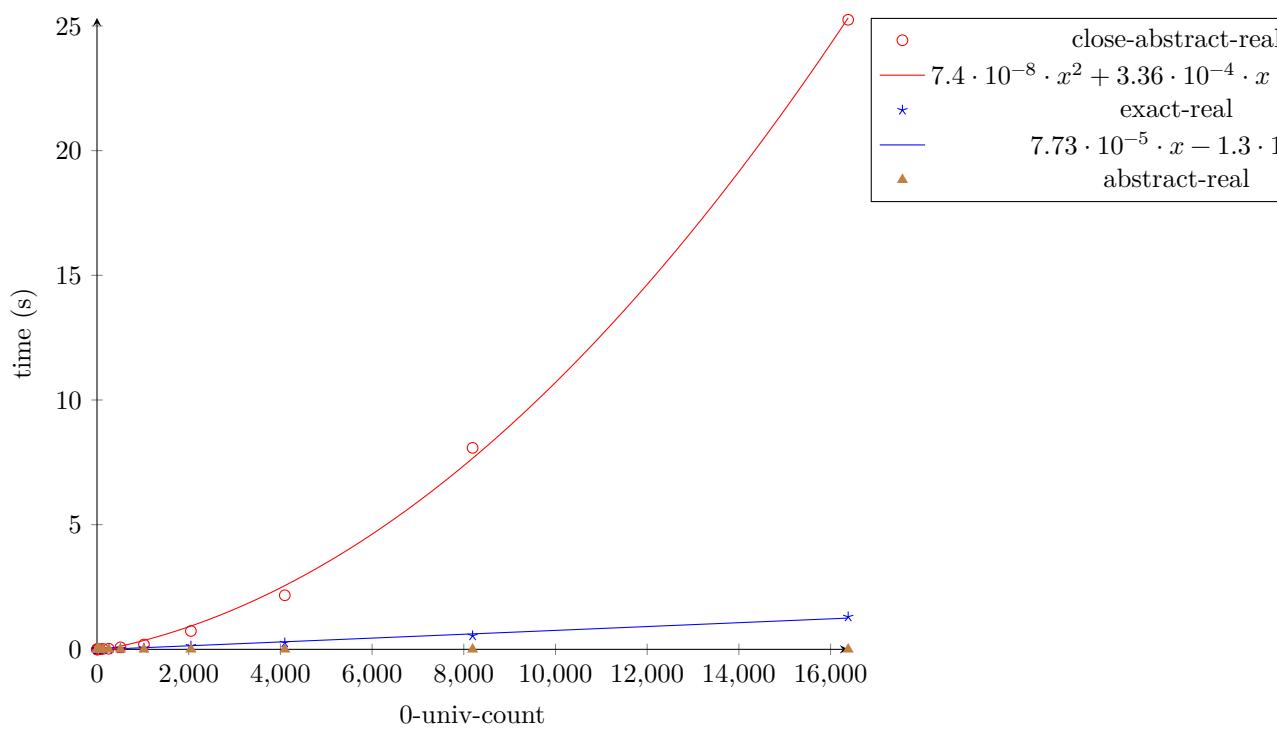


Figure 2: timing-n-polymorphic-universes param-1-n 0

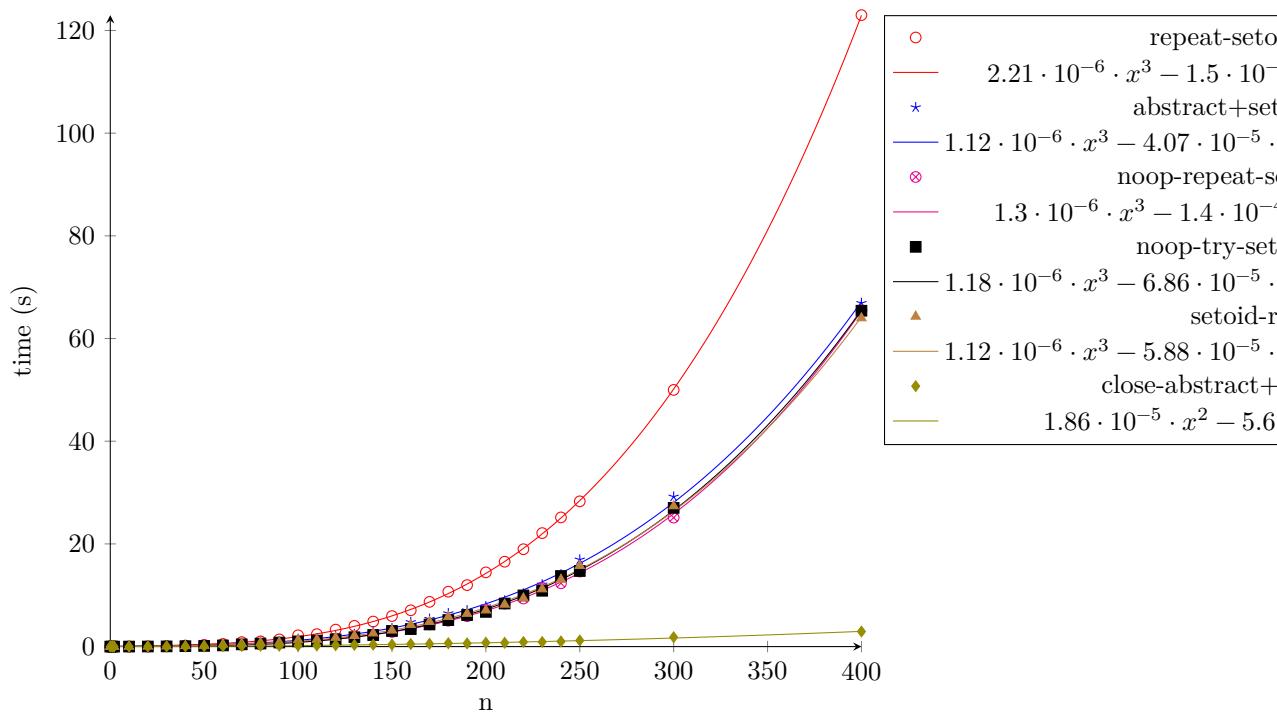


Figure 3: timing-repeat-setoid-rewrite-under-binders

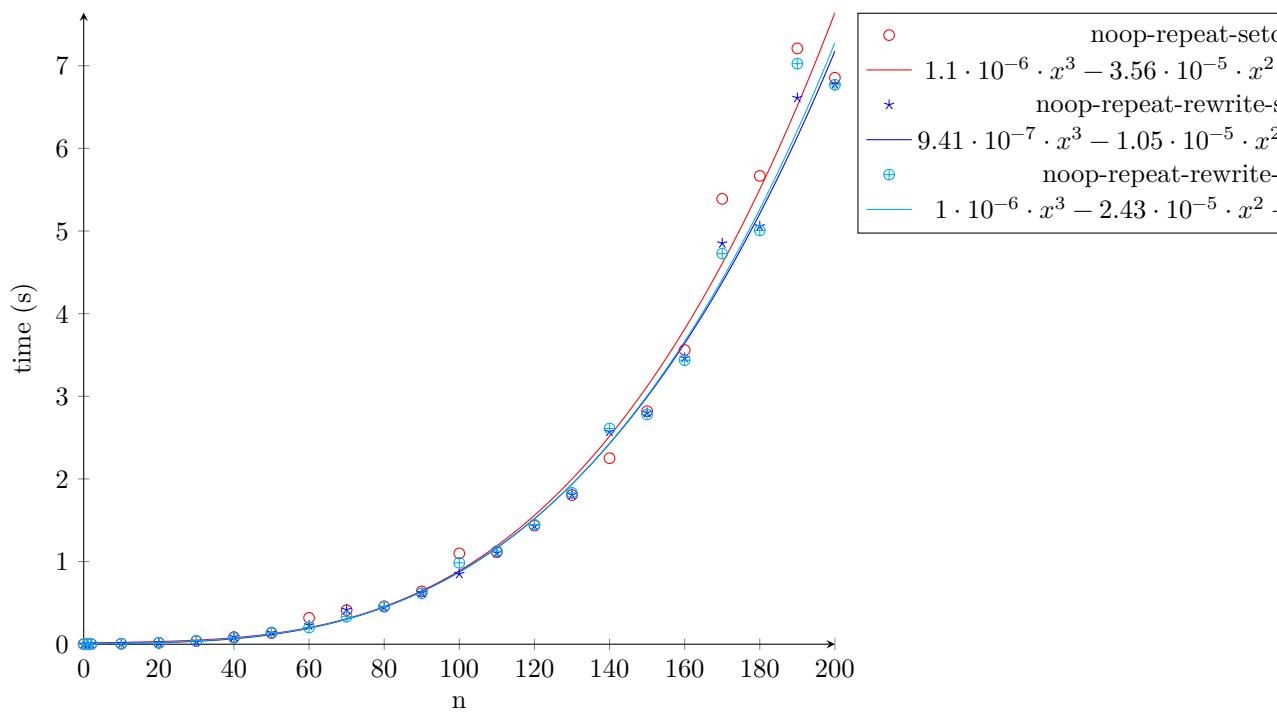


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

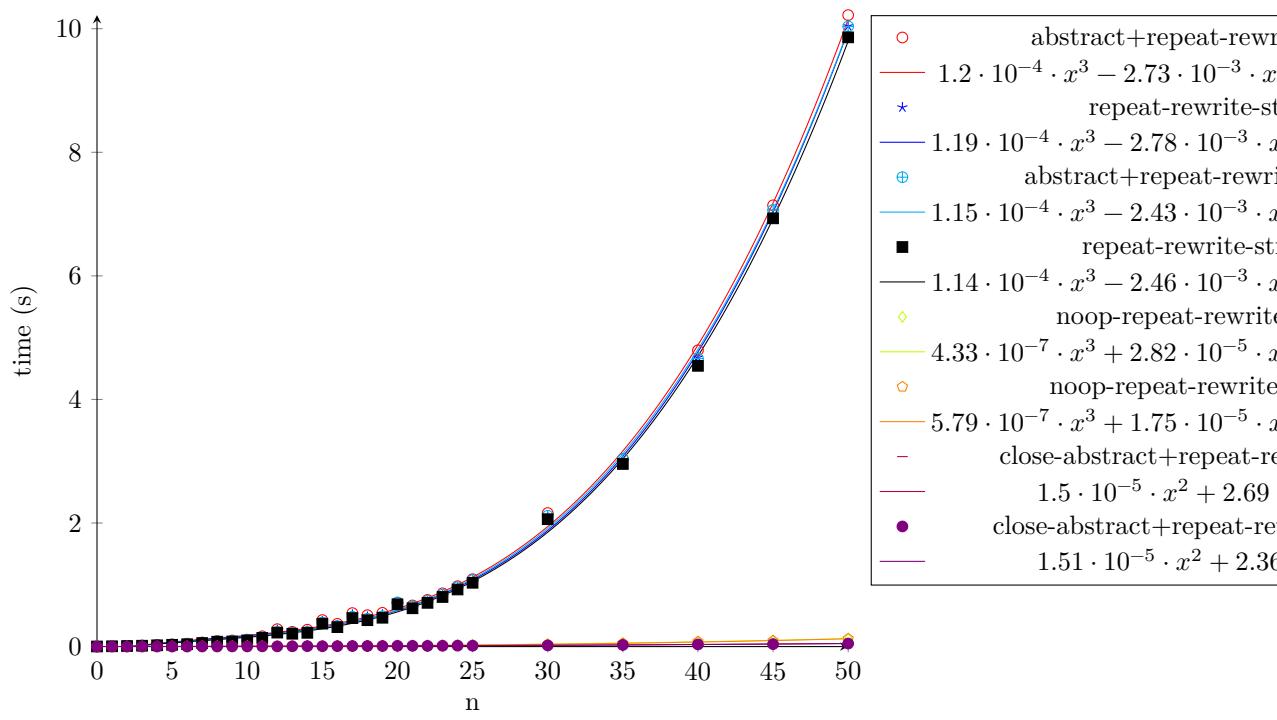


Figure 5: timing-rewrite-strat-under-binders

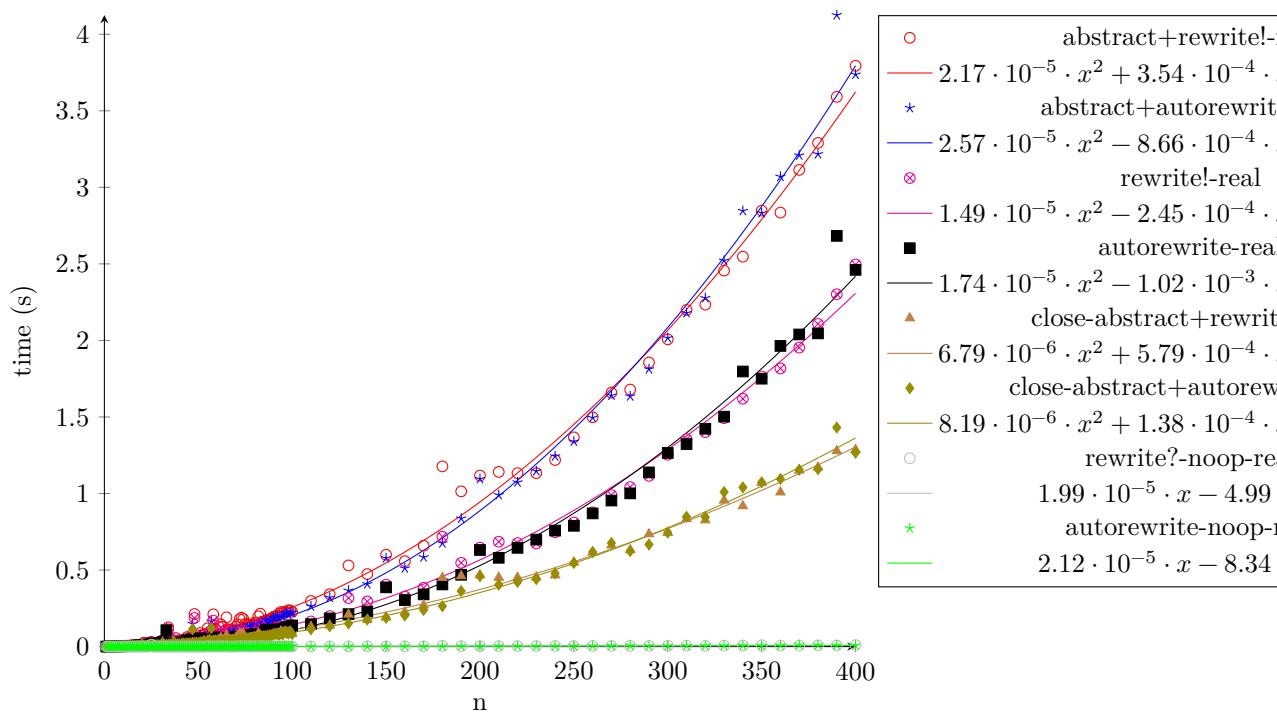


Figure 6: timing-rewrite-repeated-app-autorewrite

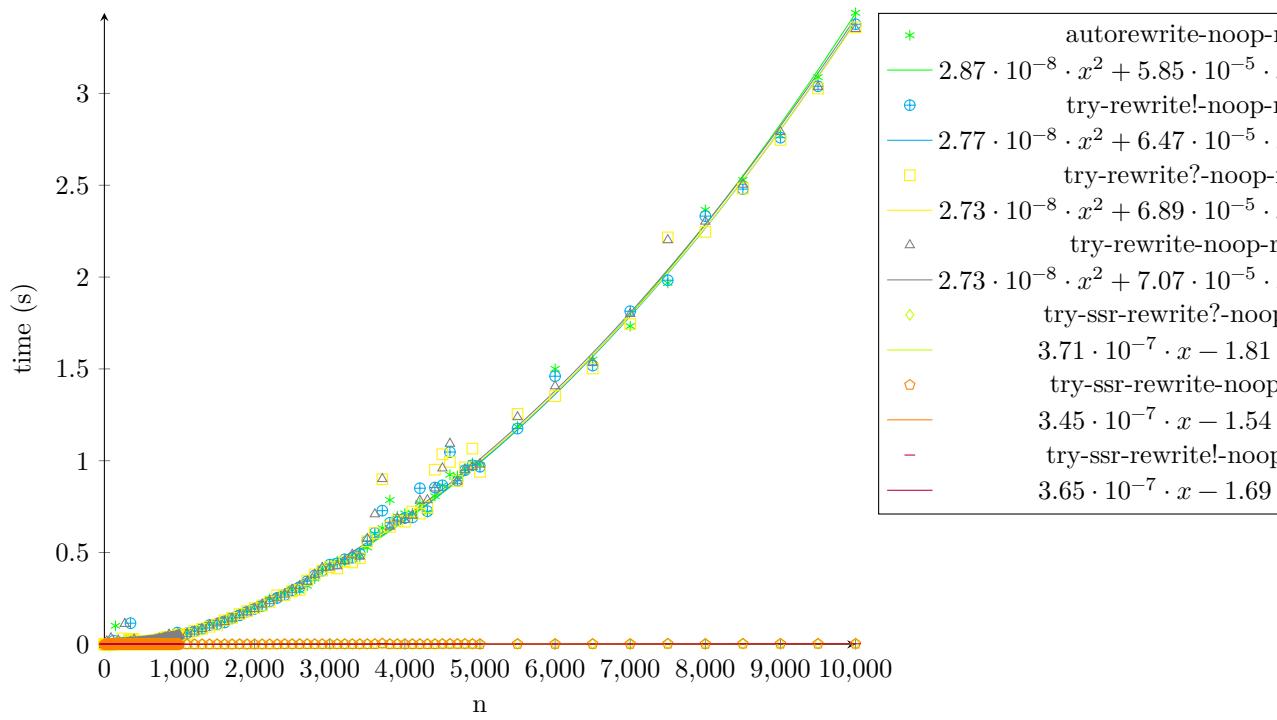


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

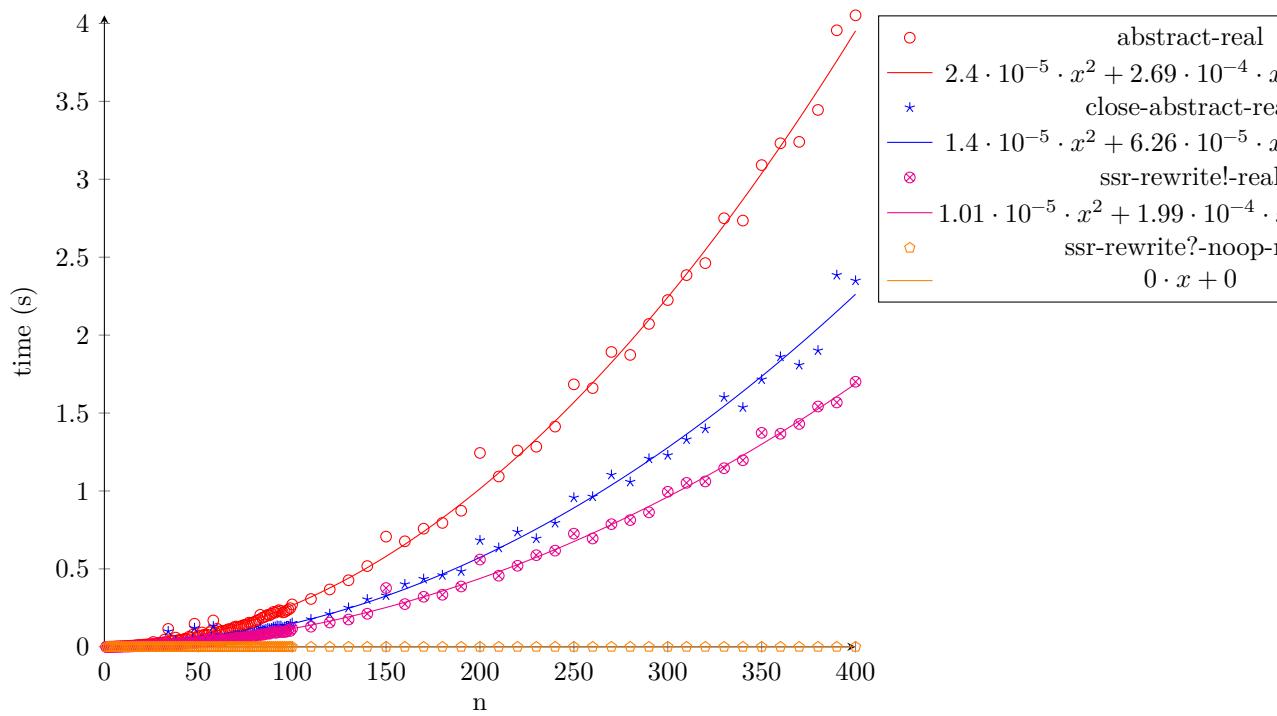


Figure 8: timing-rewrite-repeated-app-ssrrewrite

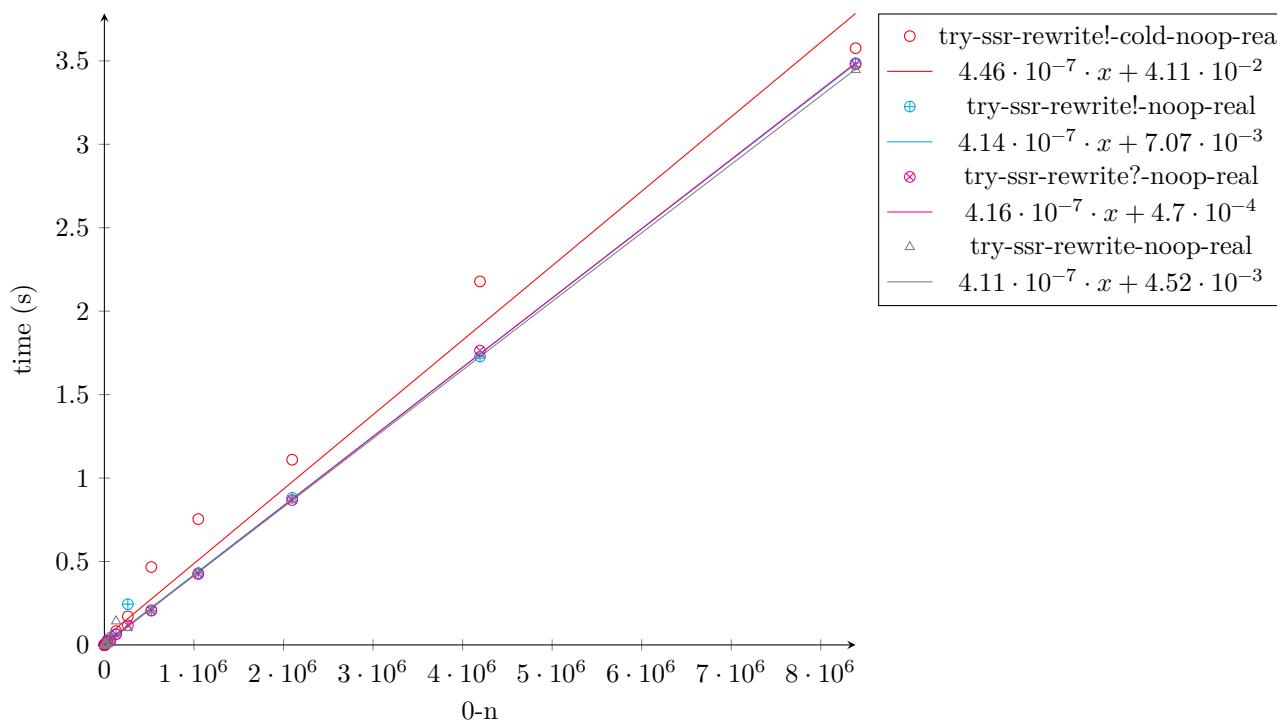


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn 1

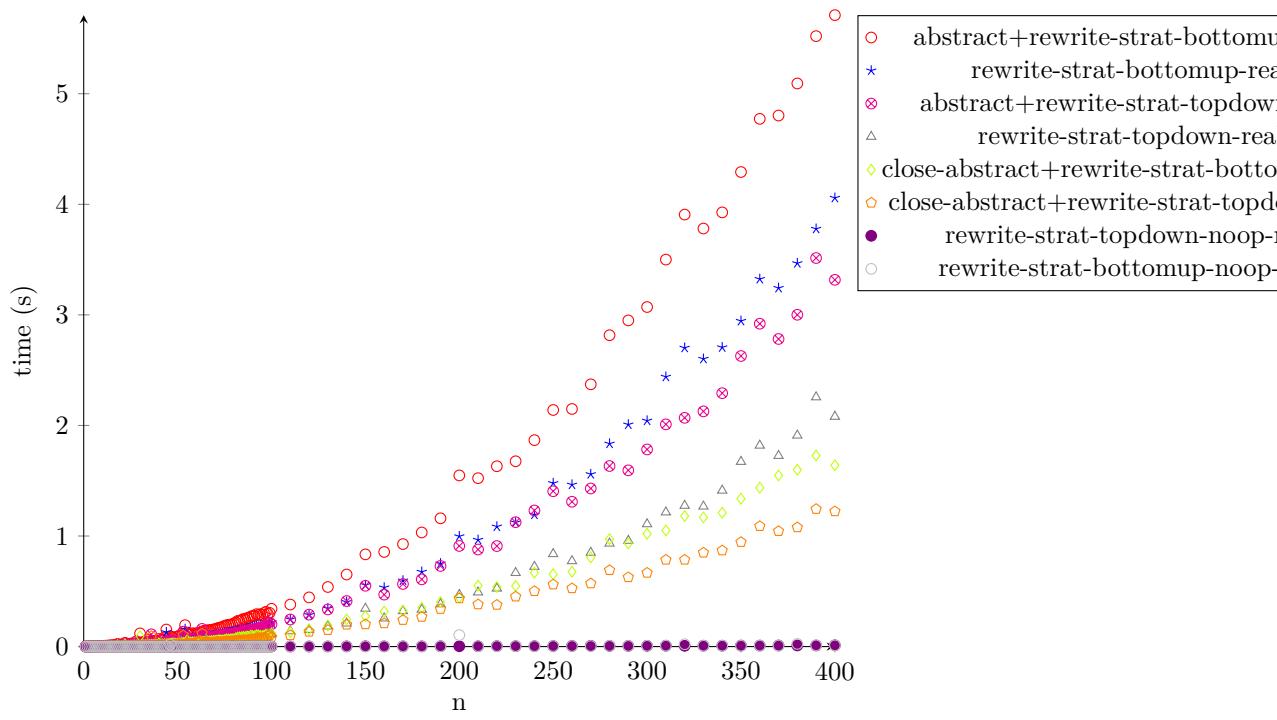


Figure 10: timing-rewrite-repeated-app-rewrite-strat

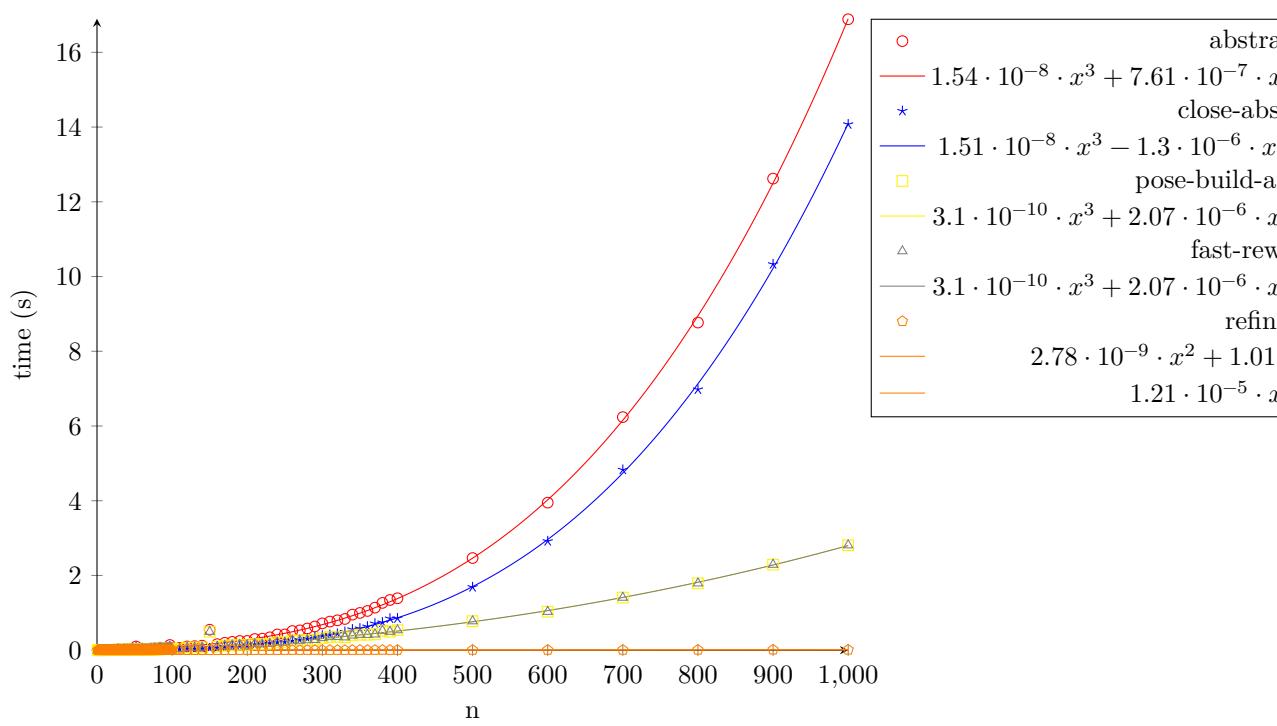


Figure 11: timing-rewrite-repeated-app-fast-rewrite

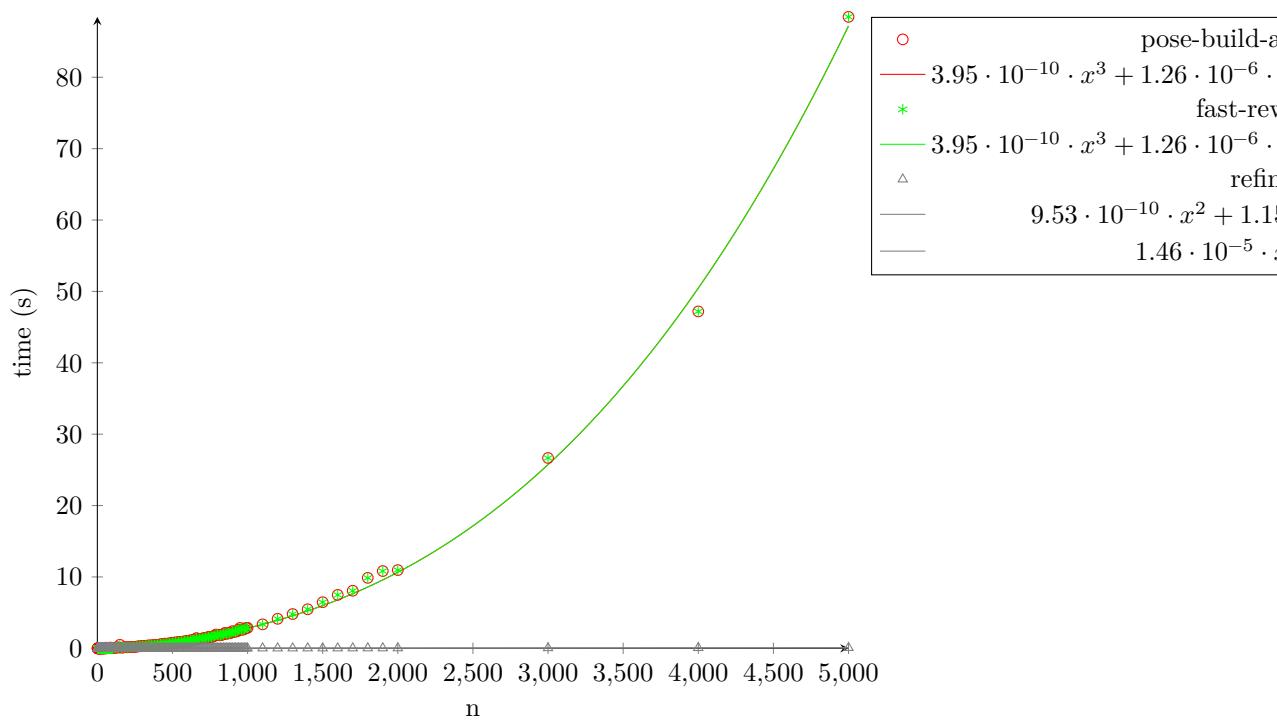


Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract

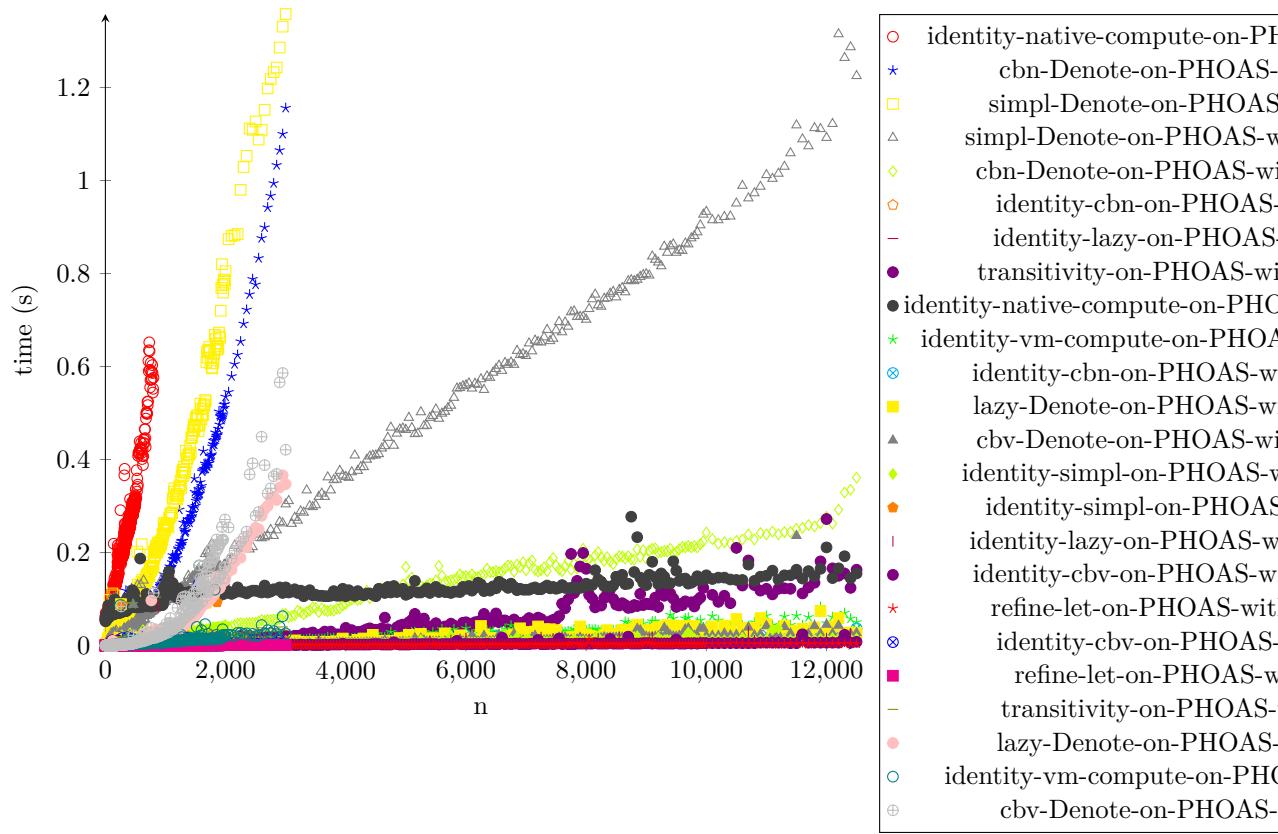


Figure 13: timing-Reify/BaselineStats

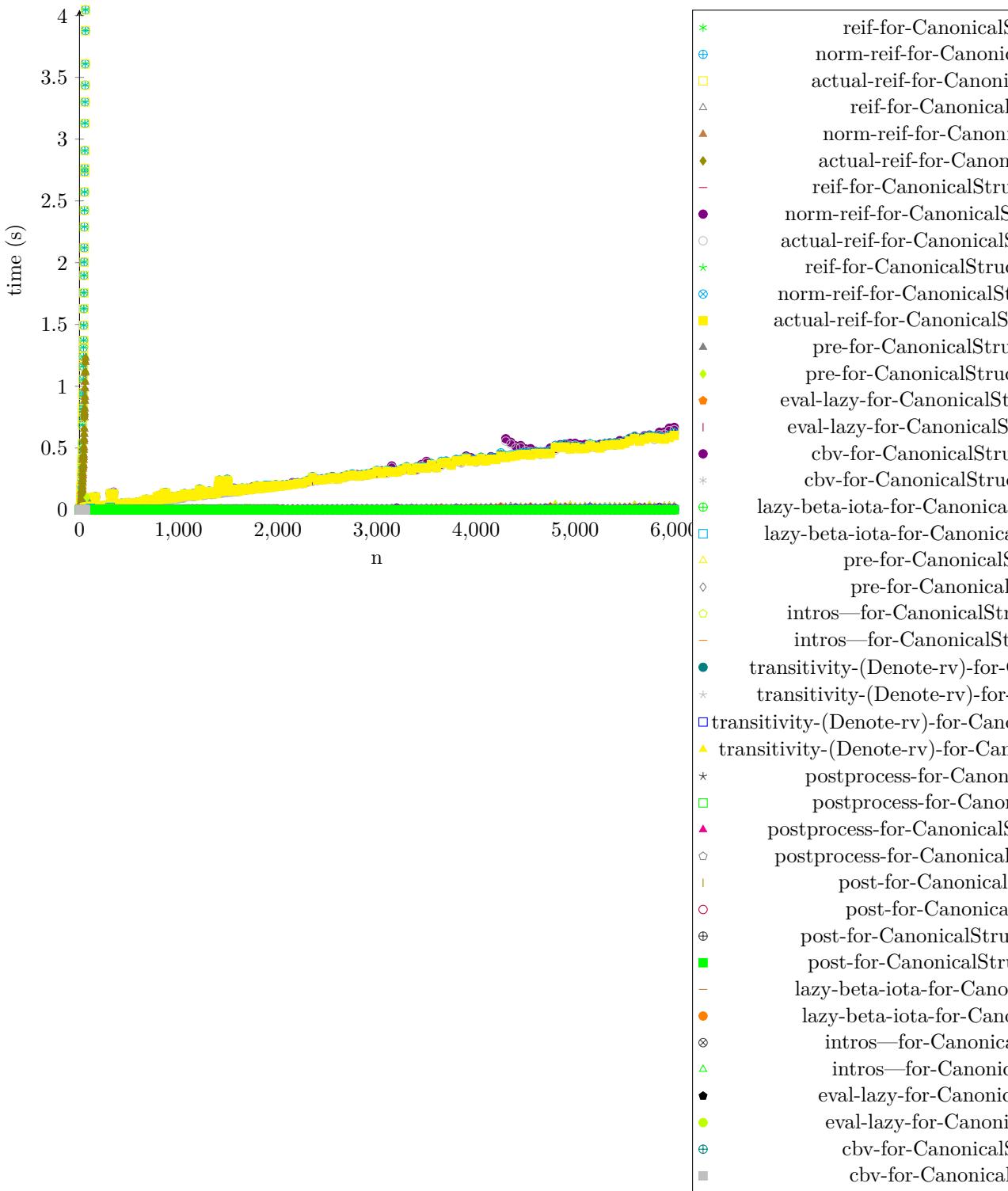


Figure 14: timing-Reify/CanonicalStructures ¹⁴



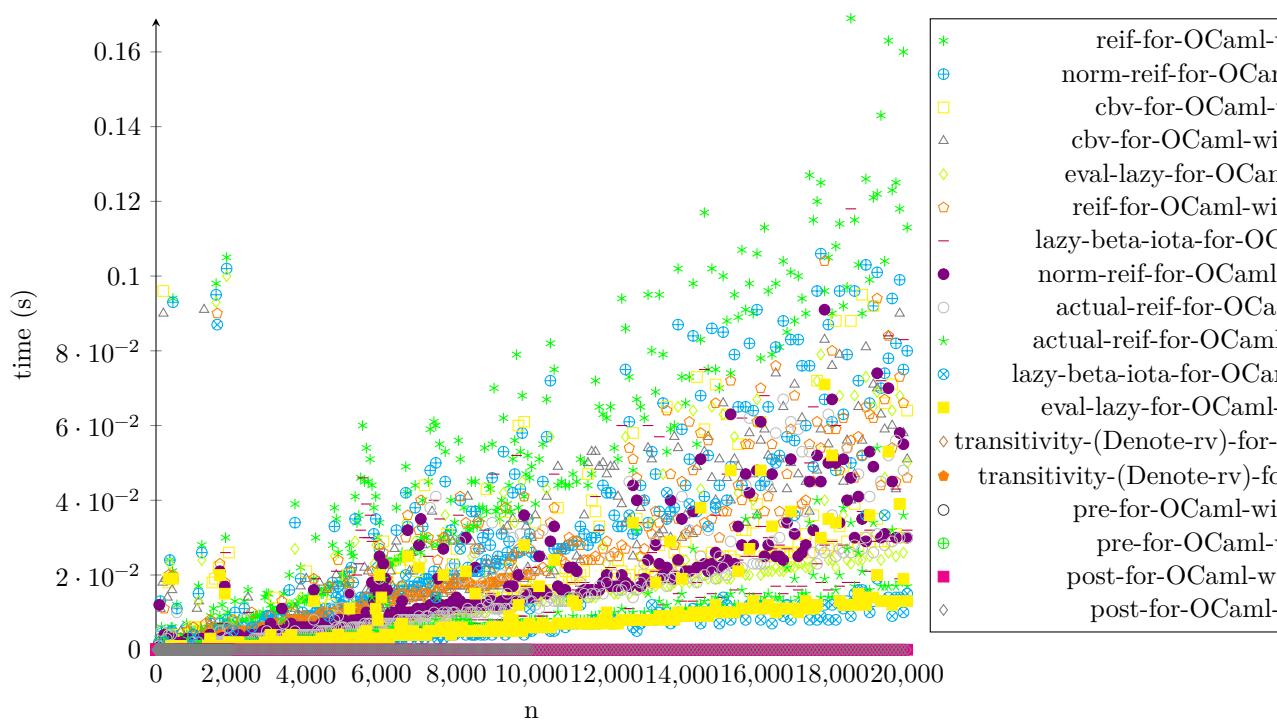
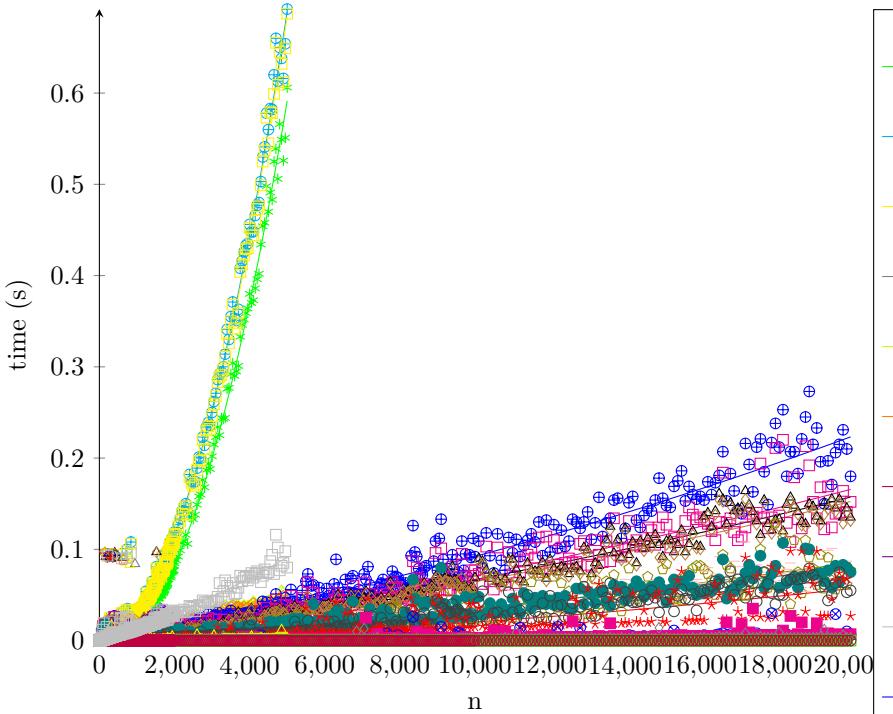


Figure 16: timing-Reify/OCaml



eval-lazy-for-beta-P

$$2.58 \cdot 10^{-8} \cdot x^2 - 1$$

reif-for-beta-Para

$$2.7 \cdot 10^{-8} \cdot x^2 + 2.$$

norm-reif-for-beta-H

$$2.7 \cdot 10^{-8} \cdot x^2 + 1.$$

cbv-for-beta-Param

$$-4.24 \cdot 10^{-11} \cdot x^2 + 1$$

reif-for-beta-Param

$$1.52 \cdot 10^{-10} \cdot x^2 + 8$$

norm-reif-for-beta-Par

$$1.96 \cdot 10^{-10} \cdot x^2 + 7$$

actual-reif-for-beta-Par

$$2.07 \cdot 10^{-10} \cdot x^2 + 7$$

cbv-for-beta-Param

$$8.81 \cdot 10^{-11} \cdot x^2 + 1$$

lazy-beta-iota-for-beta

$$8.74 \cdot 10^{-11} \cdot x^2 + 7$$

reif-for-Parametr

$$1.97 \cdot 10^{-10} \cdot x^2 + 7$$

norm-reif-for-Param

$$1.18 \cdot 10^{-10} \cdot x^2 + 5$$

reif-for-Parametrici

$$1.22 \cdot 10^{-10} \cdot x^2 + 5$$

norm-reif-for-Paramet

$$1.21 \cdot 10^{-10} \cdot x^2 + 5$$

eval-lazy-for-Paramet

$$7.75 \cdot 10^{-11} \cdot x^2 + 2$$

actual-reif-for-Paramet

$$6.55 \cdot 10^{-11} \cdot x^2 + 2$$

actual-reif-for-Param

$$4.18 \cdot 10^{-11} \cdot x^2 + 3$$

eval-lazy-for-Paramet

$$5.67 \cdot 10^{-11} \cdot x^2 + 2$$

lazy-beta-iota-for-Param

$$8.16 \cdot 10^{-11} \cdot x^2 + 1$$

cbv-for-Parametrici

$$5.17 \cdot 10^{-12} \cdot x^2 + 3$$

cbv-for-Parametr

$$1.05 \cdot 10^{-11} \cdot x^2 + 2$$

lazy-beta-iota-for-beta-H

$$3.88 \cdot 10^{-11} \cdot x^2 + 3$$

lazy-beta-iota-for-Param

$$3.59 \cdot 10^{-12} \cdot x^2 + 1$$

eval-lazy-for-beta-Par

$$6.57 \cdot 10^{-11} \cdot x^2 + 2$$

transitivity-(Denote-rv)-for-beta

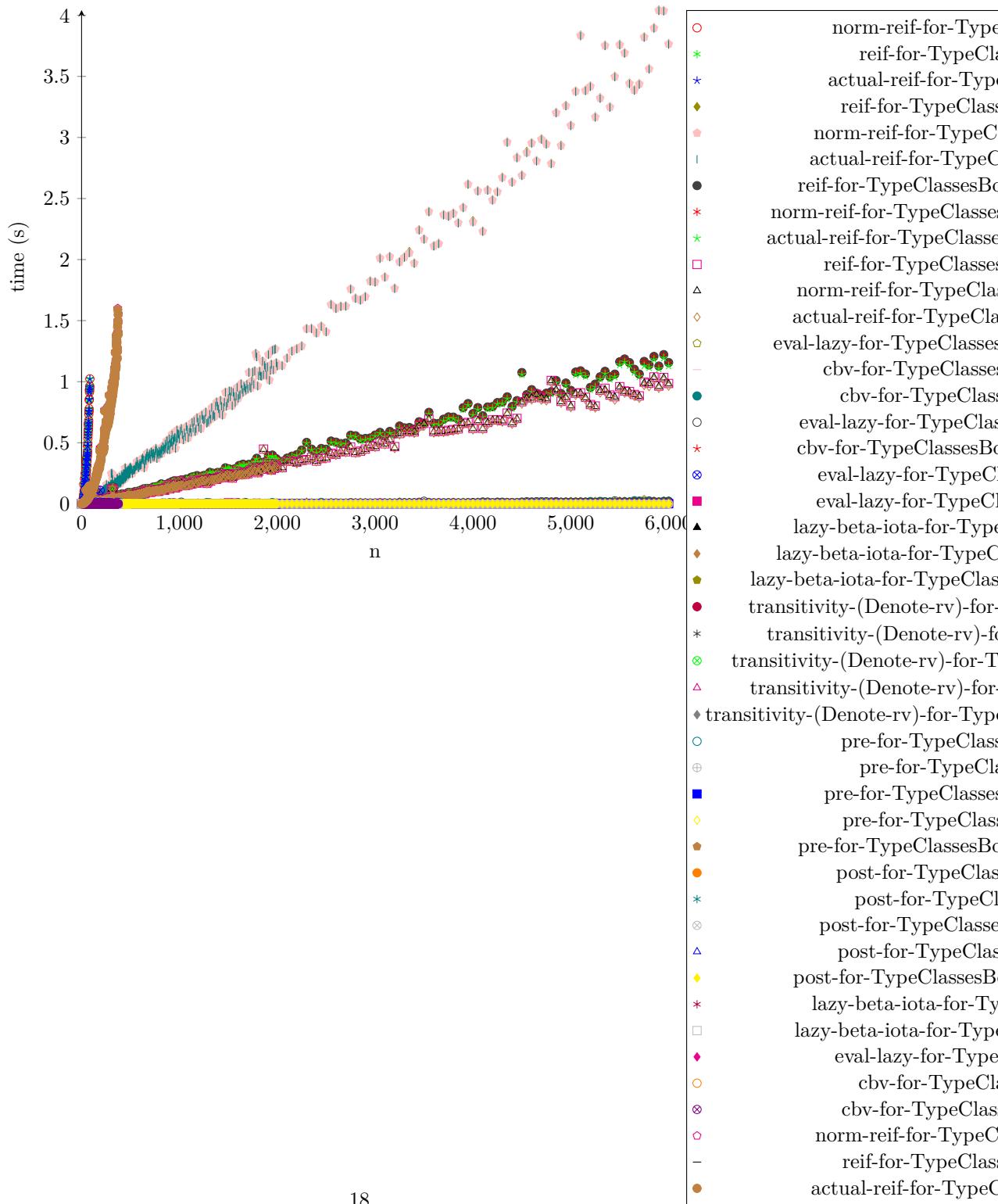
$$6.57 \cdot 10^{-11} \cdot x^2 + 2$$

transitivity-(Denote-rv)-for

$$6.57 \cdot 10^{-11} \cdot x^2 + 2$$

transitivity-(Denote-rv)-for-Par

$$6.57 \cdot 10^{-11} \cdot x^2 + 2$$



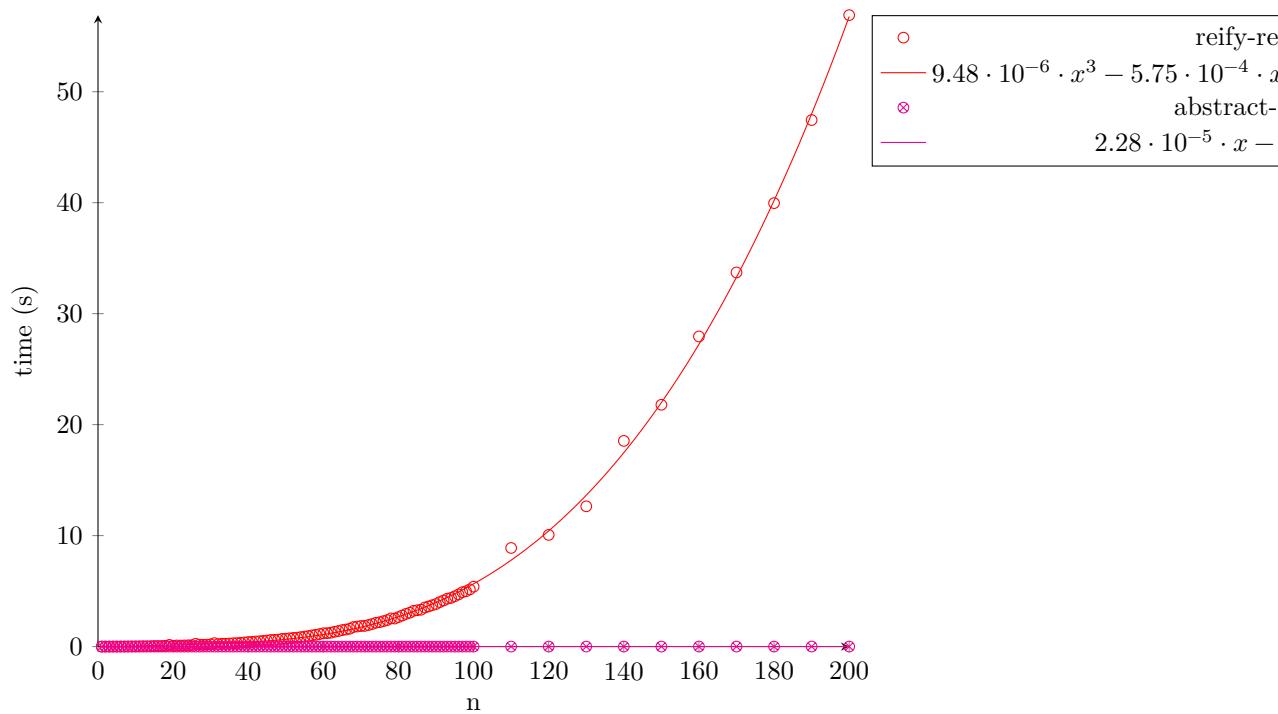


Figure 19: timing-typeclass-reification-let-in-HOAS

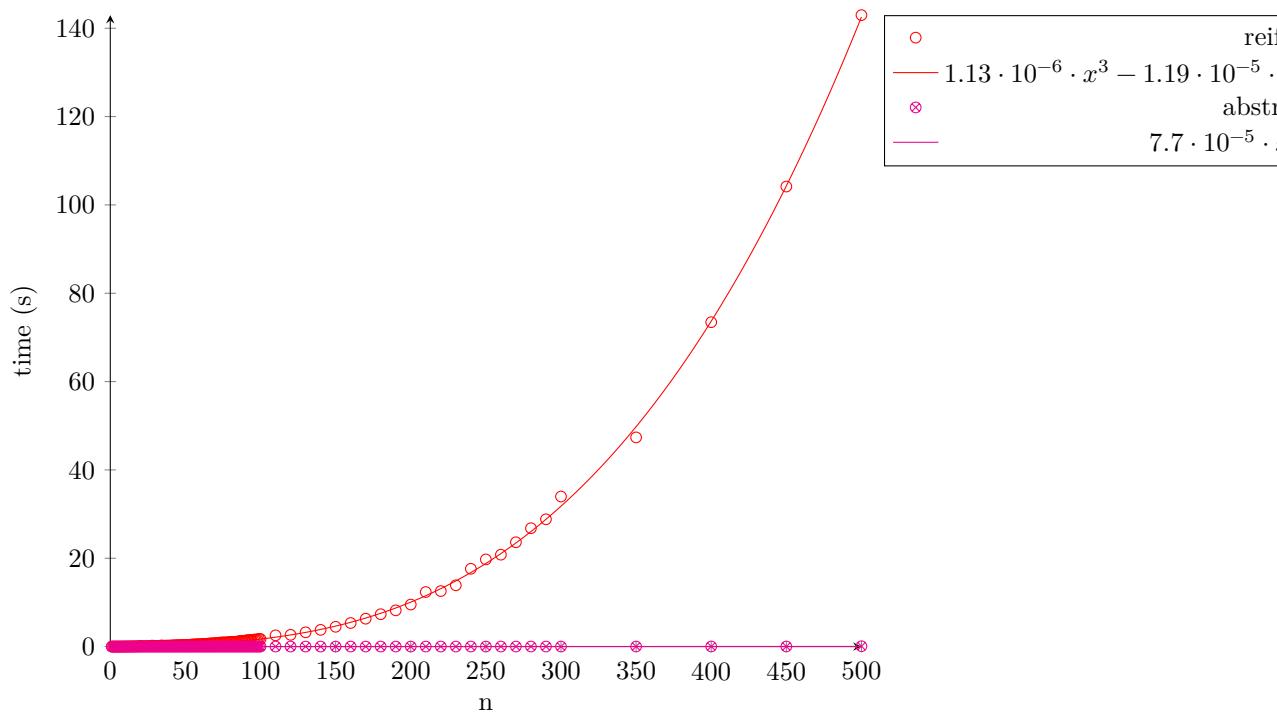


Figure 20: timing-typeclass-reification-let-in-PHOAS

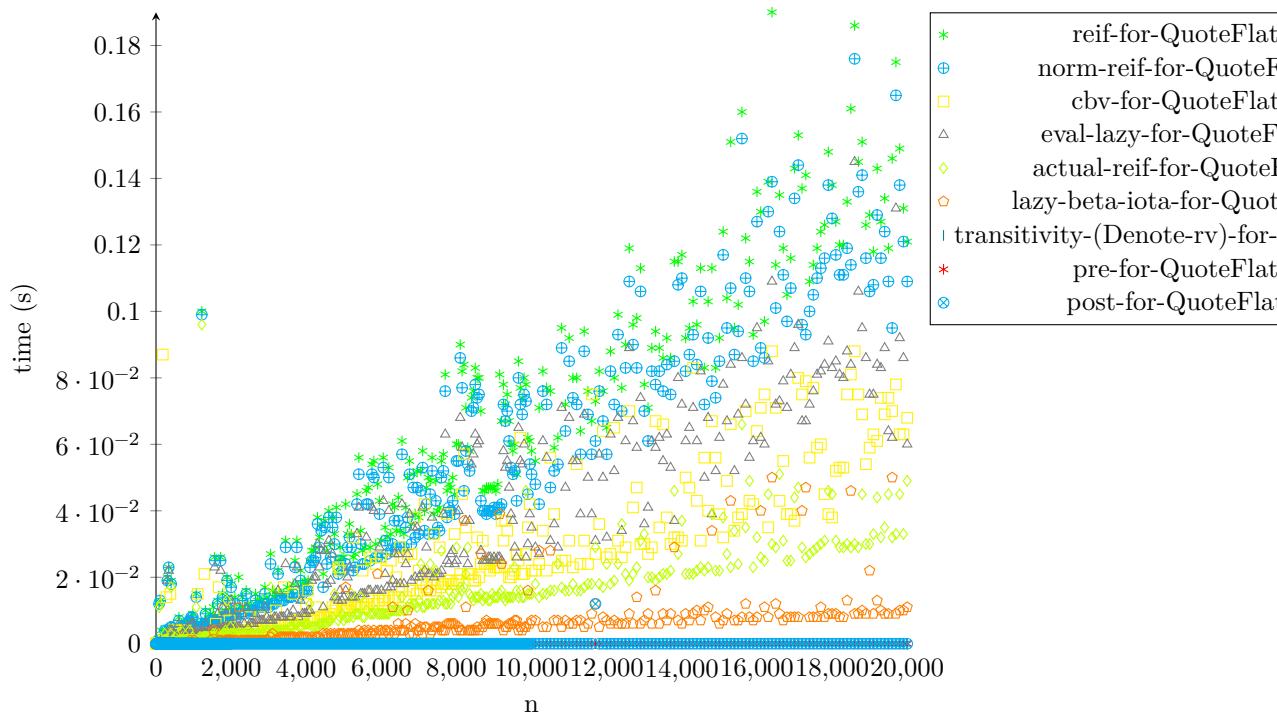


Figure 21: timing-Reify/QuoteFlat