

Figure 1: timing-pattern

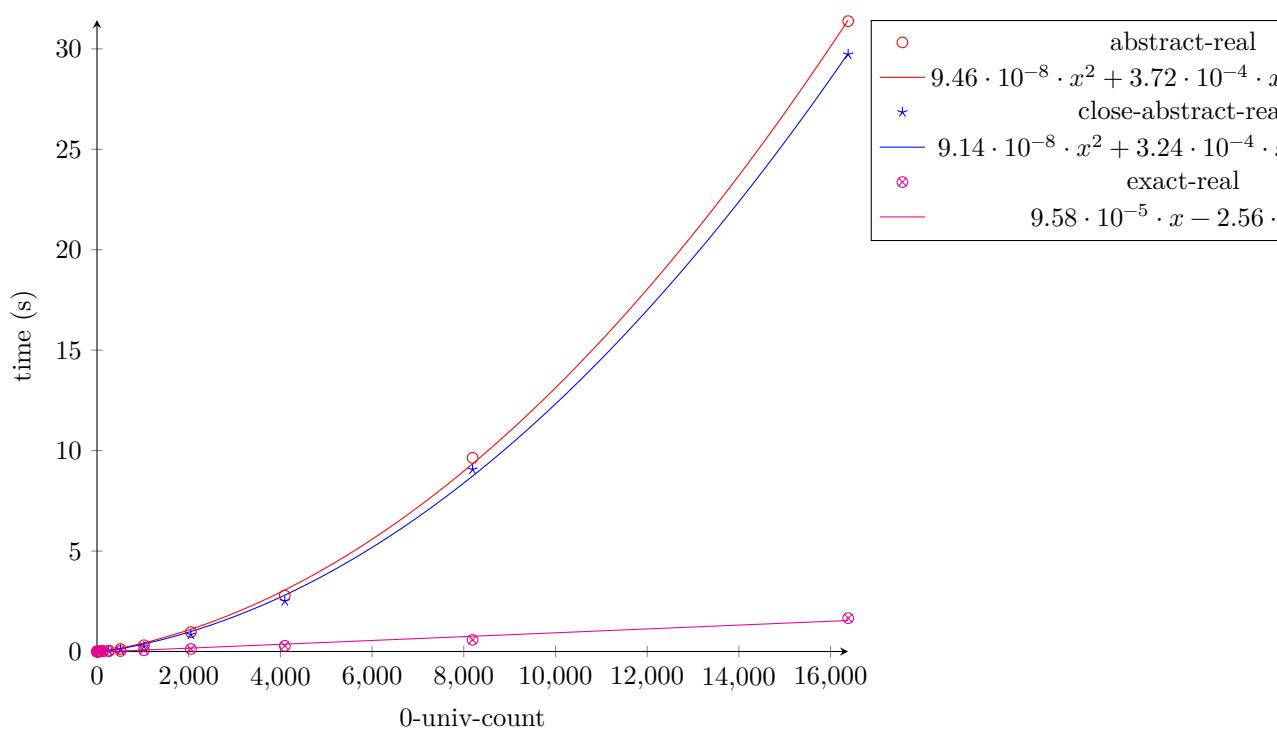


Figure 2: timing-n-polymorphic-universes param-1-n 0

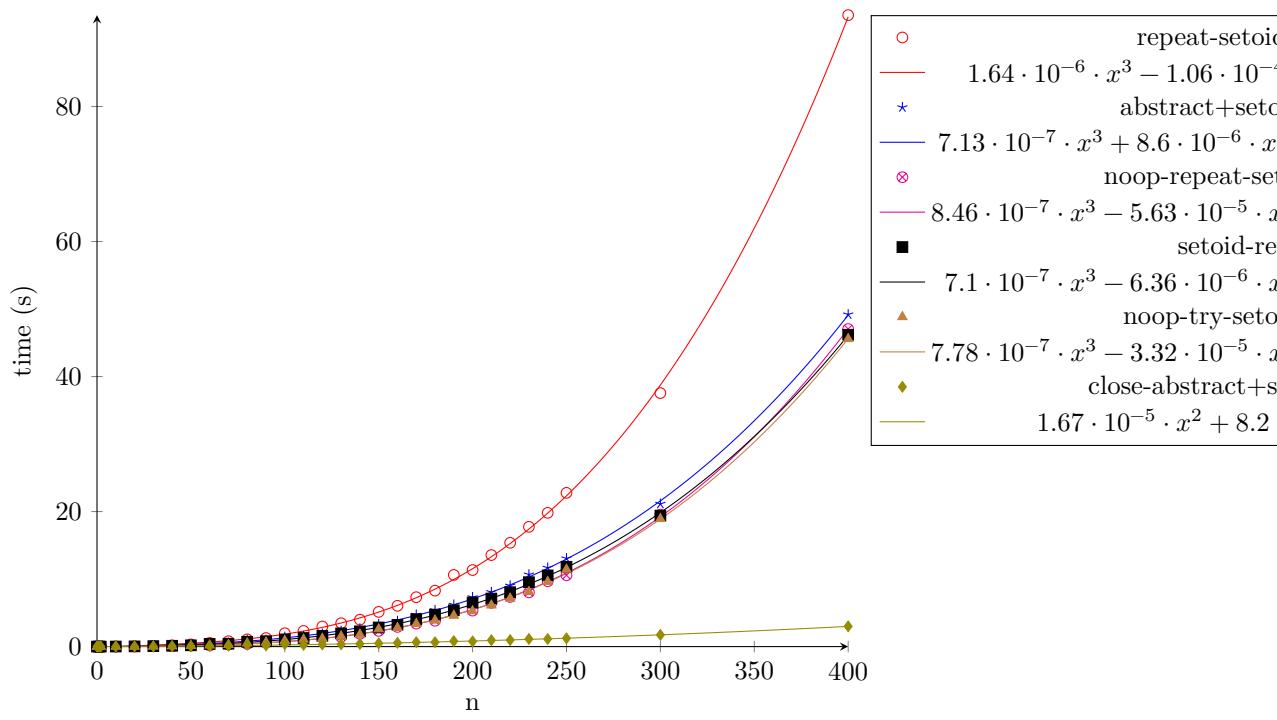


Figure 3: timing-repeat-setoid-rewrite-under-binders

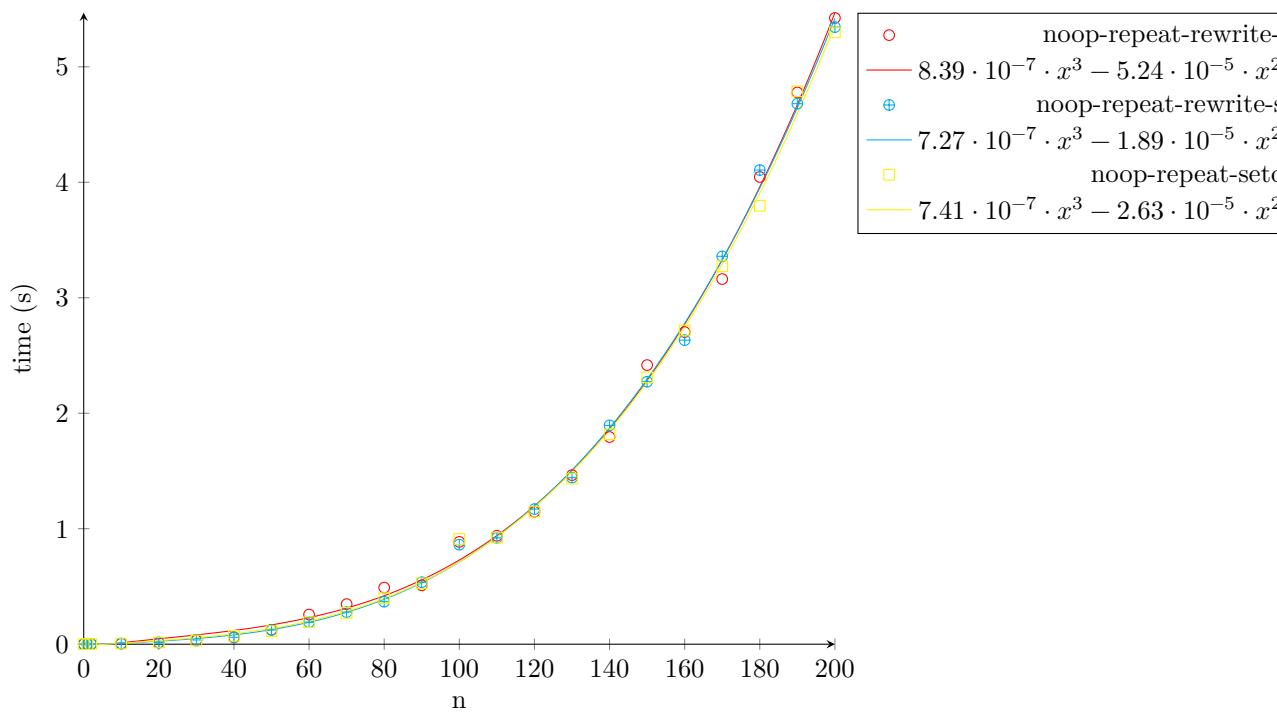


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

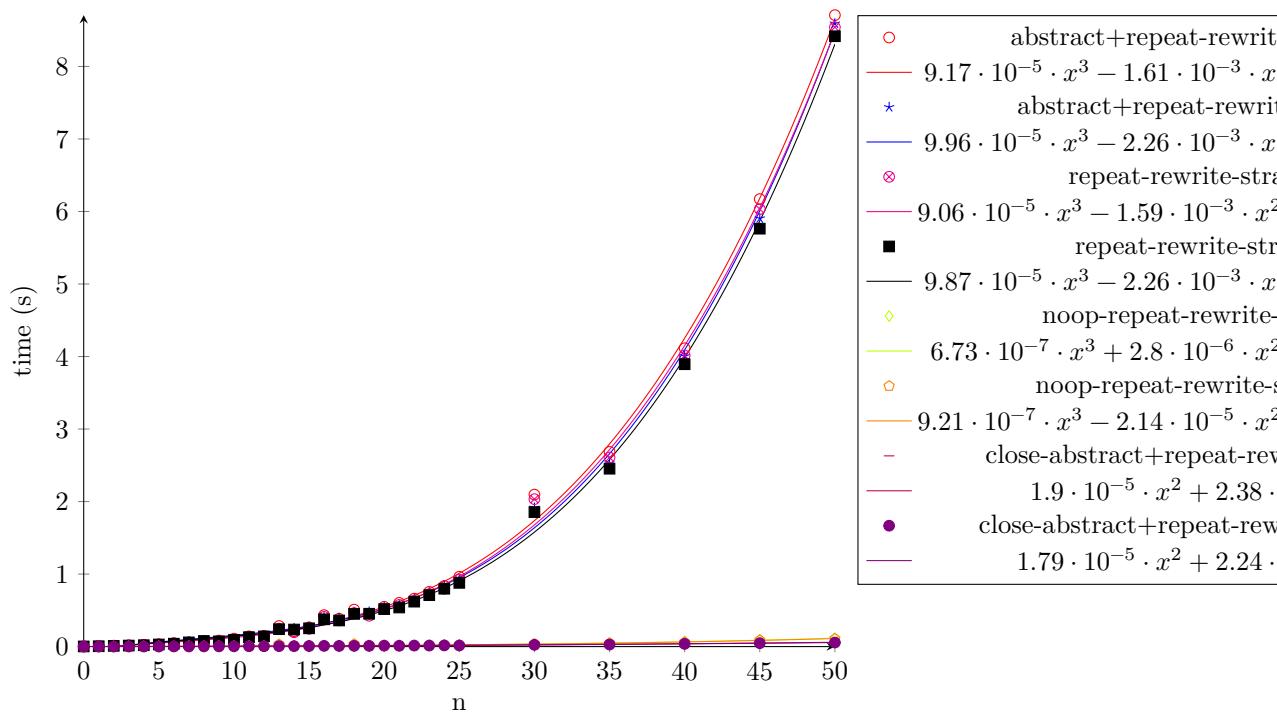


Figure 5: timing-rewrite-strat-under-binders

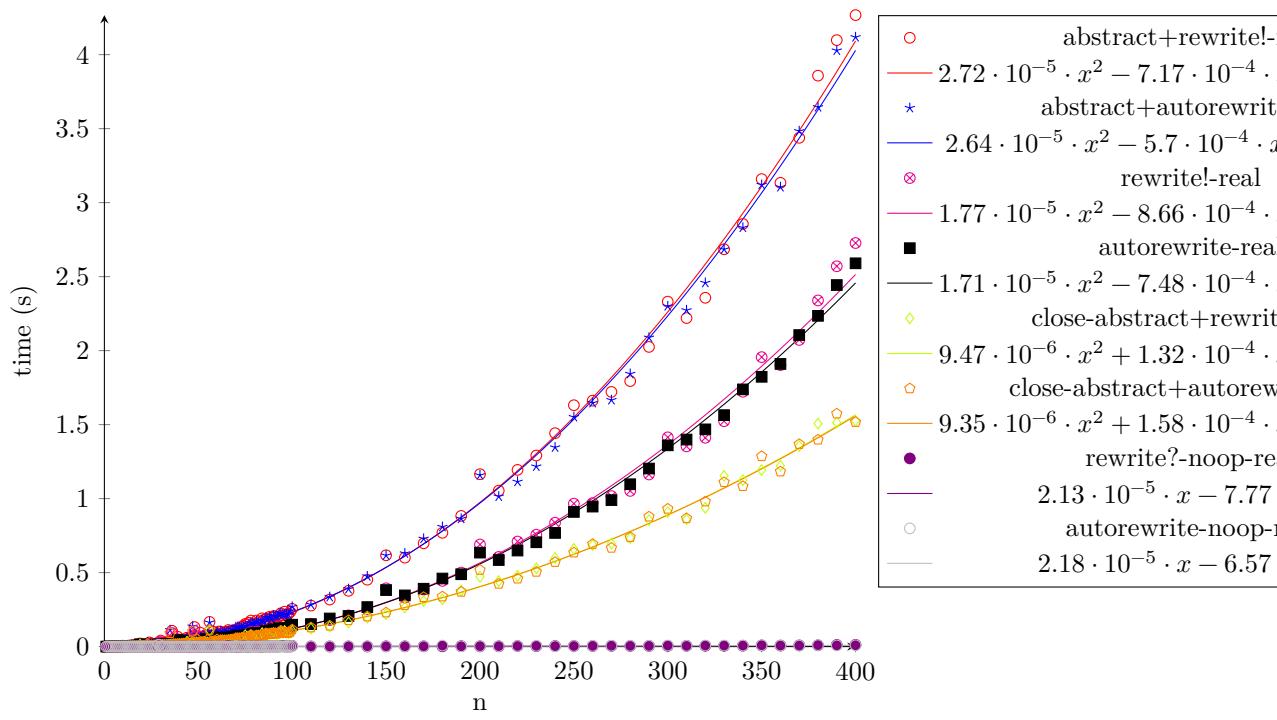


Figure 6: timing-rewrite-repeated-app-autorewrite

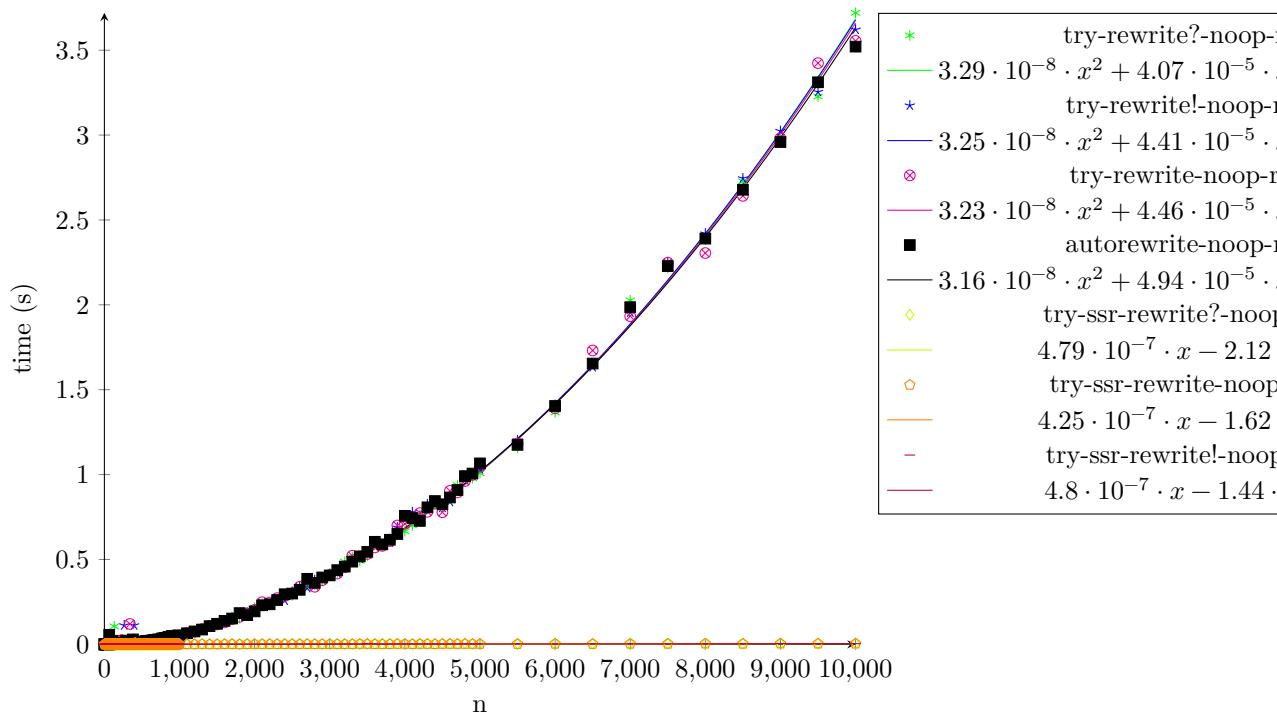


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

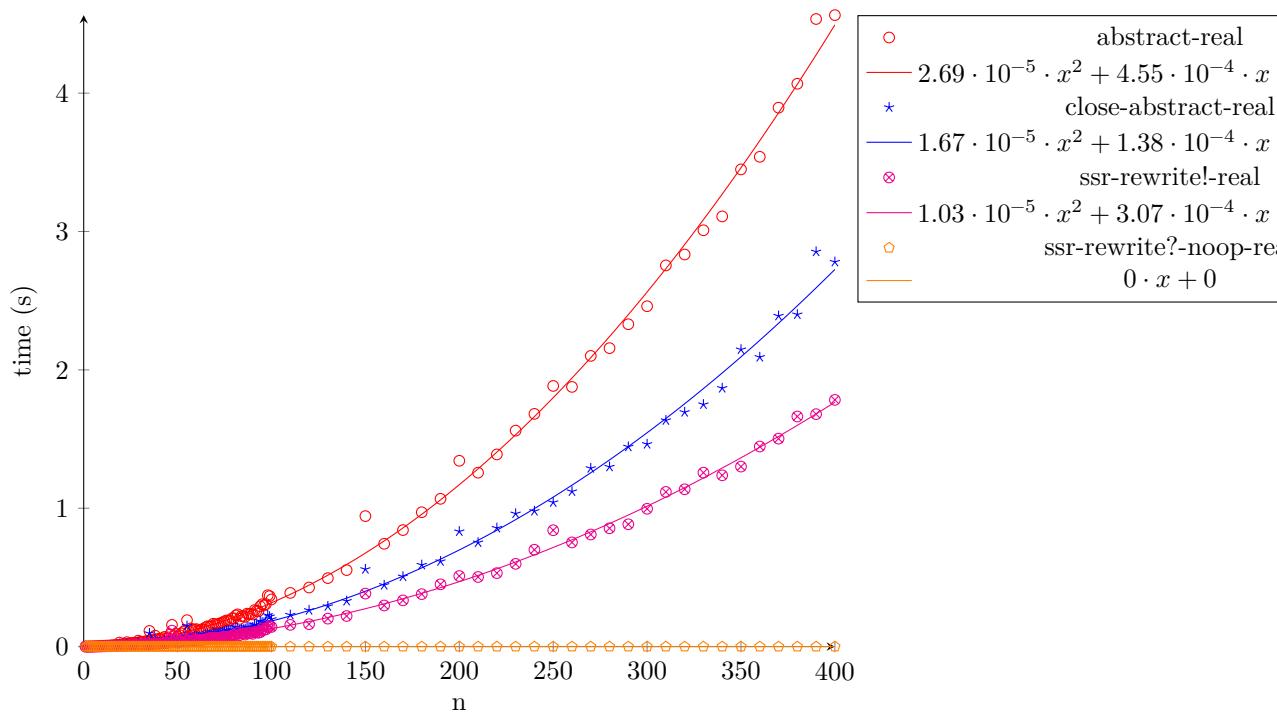


Figure 8: timing-rewrite-repeated-app-ssrrewrite

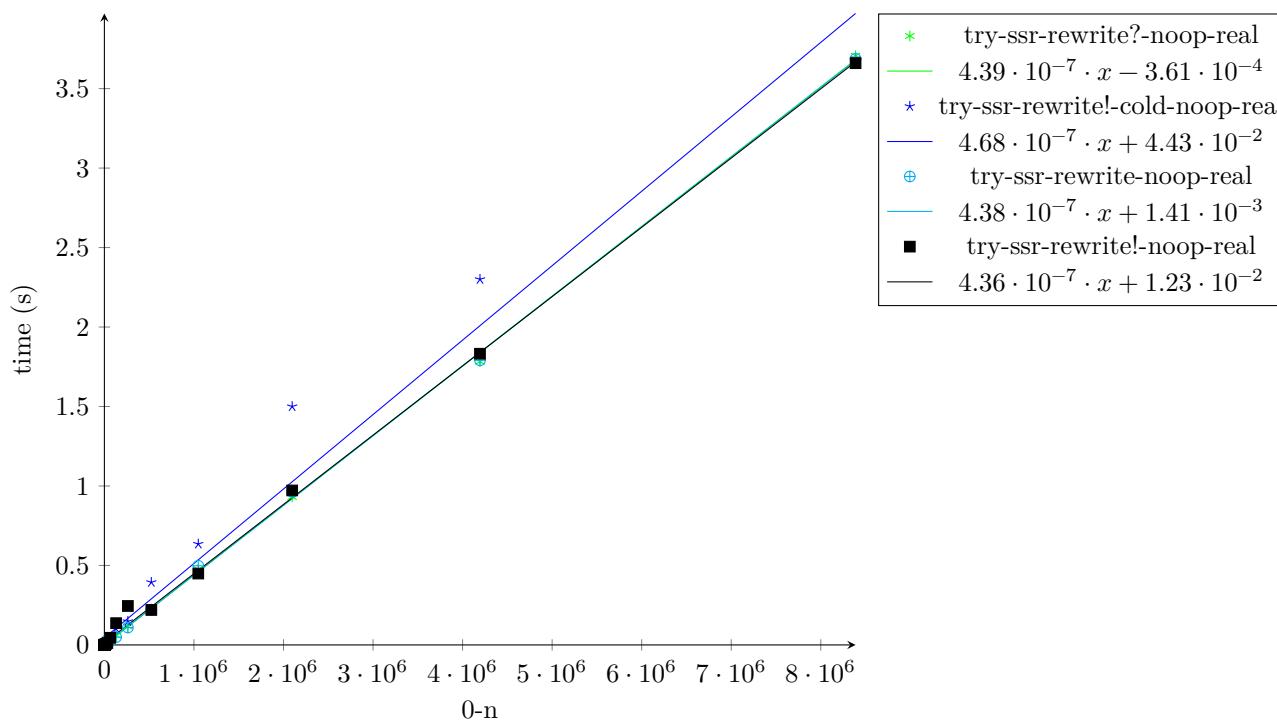


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn 1

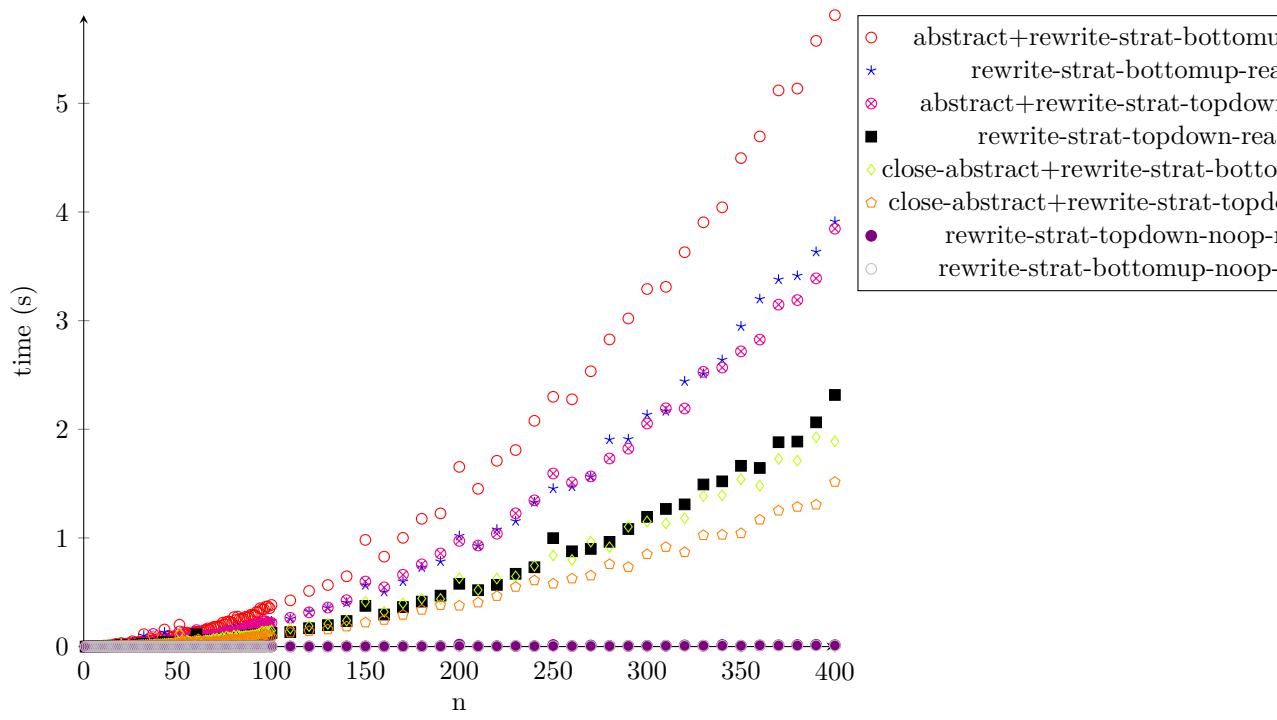


Figure 10: timing-rewrite-repeated-app-rewrite-strat

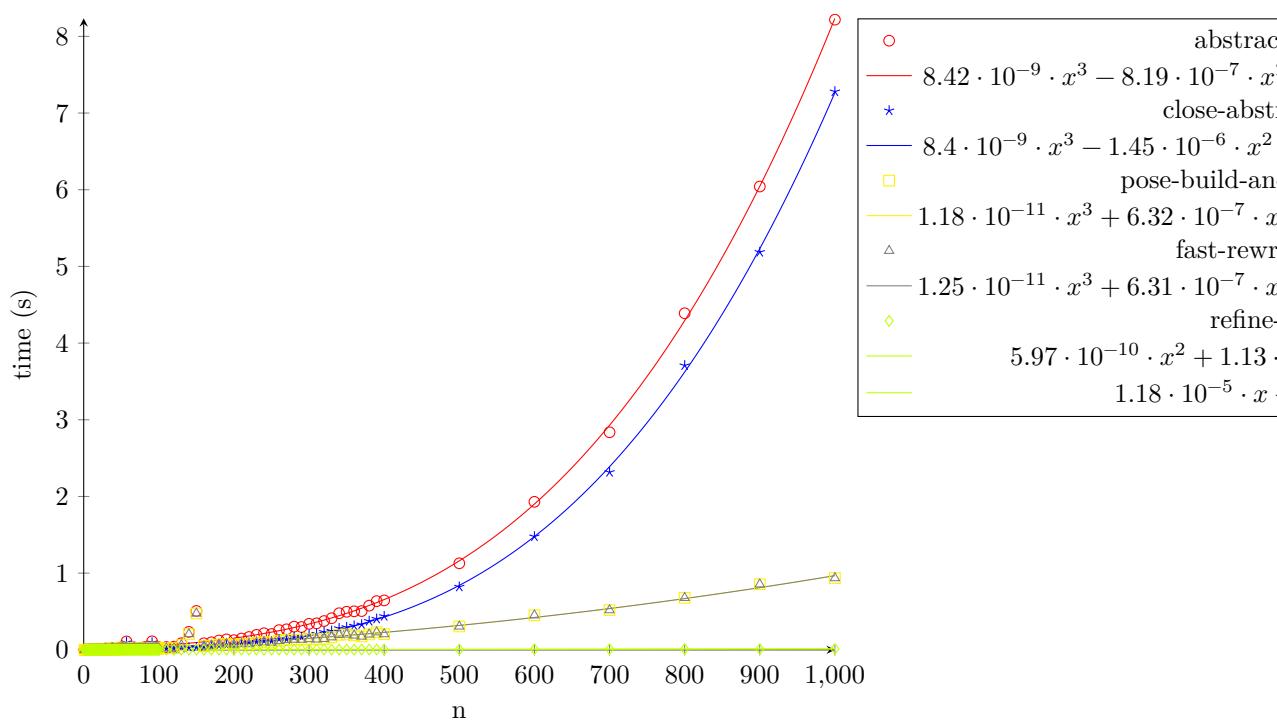


Figure 11: timing-rewrite-repeated-app-fast-rewrite

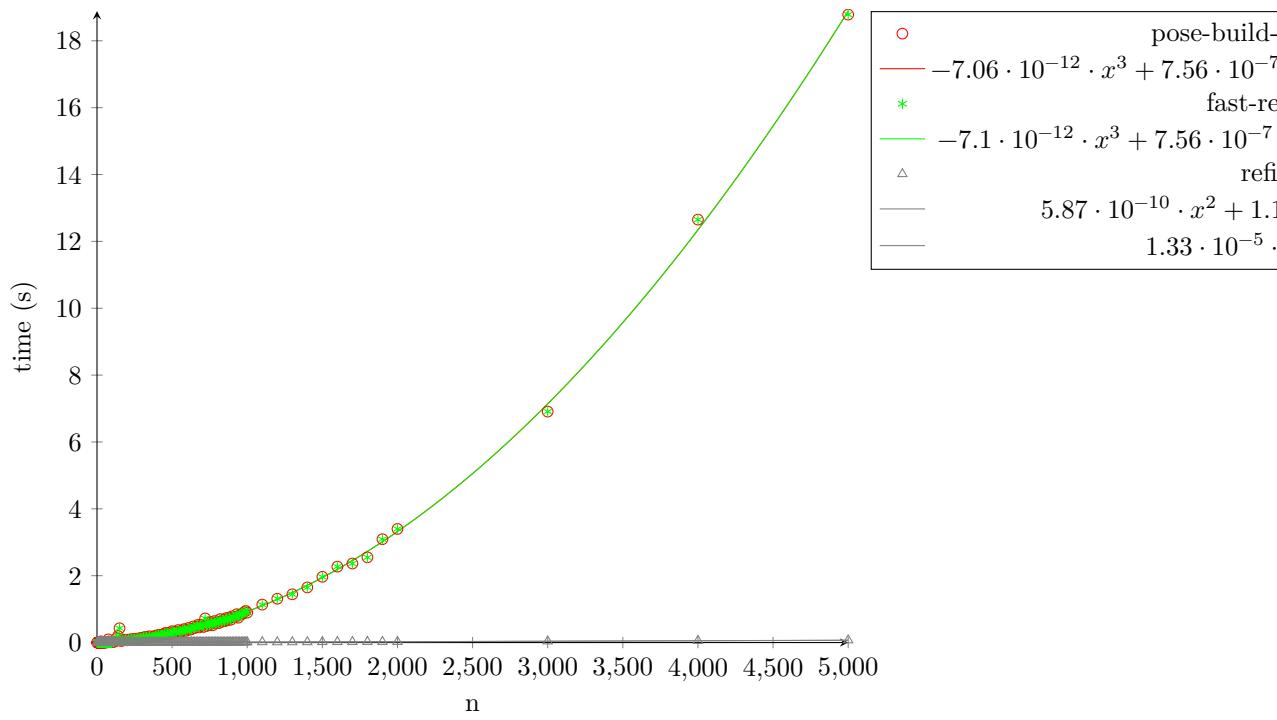


Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract

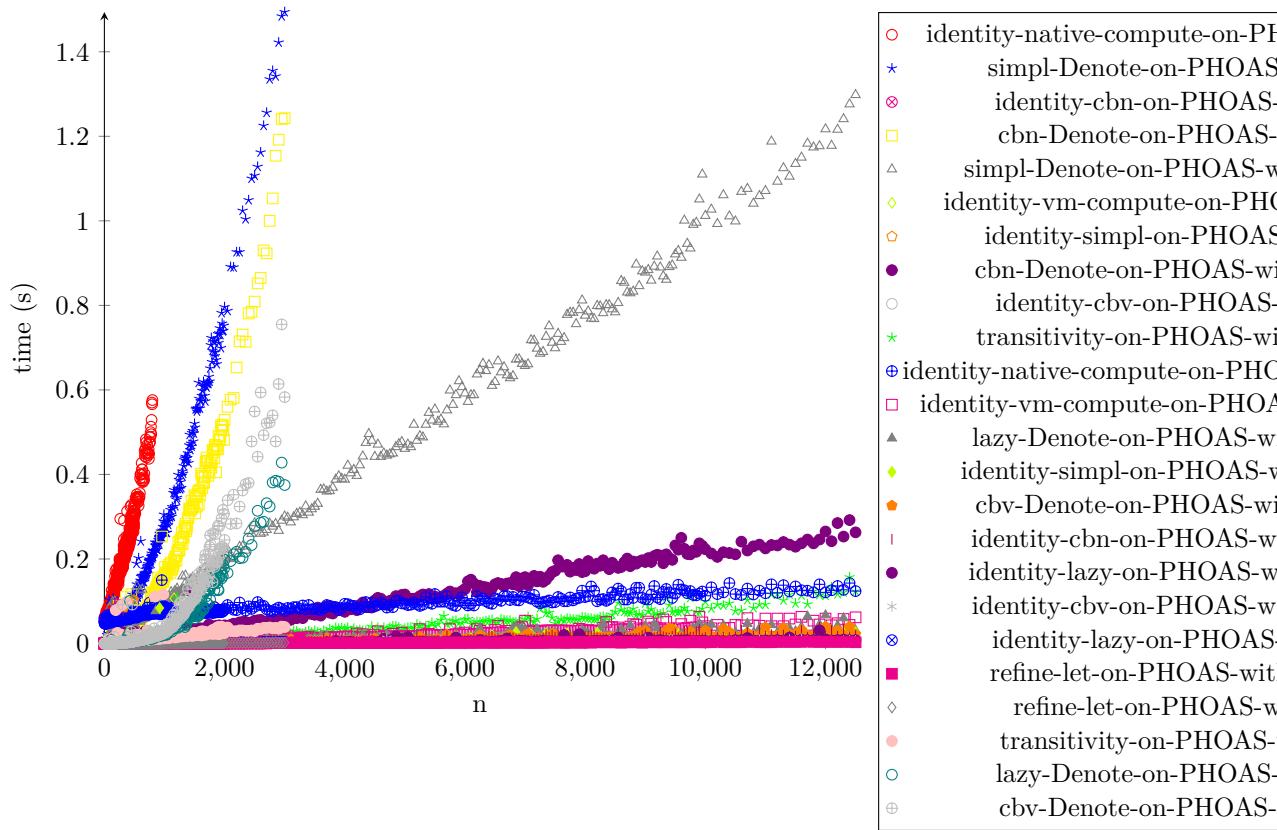


Figure 13: timing-Reify/BaselineStats

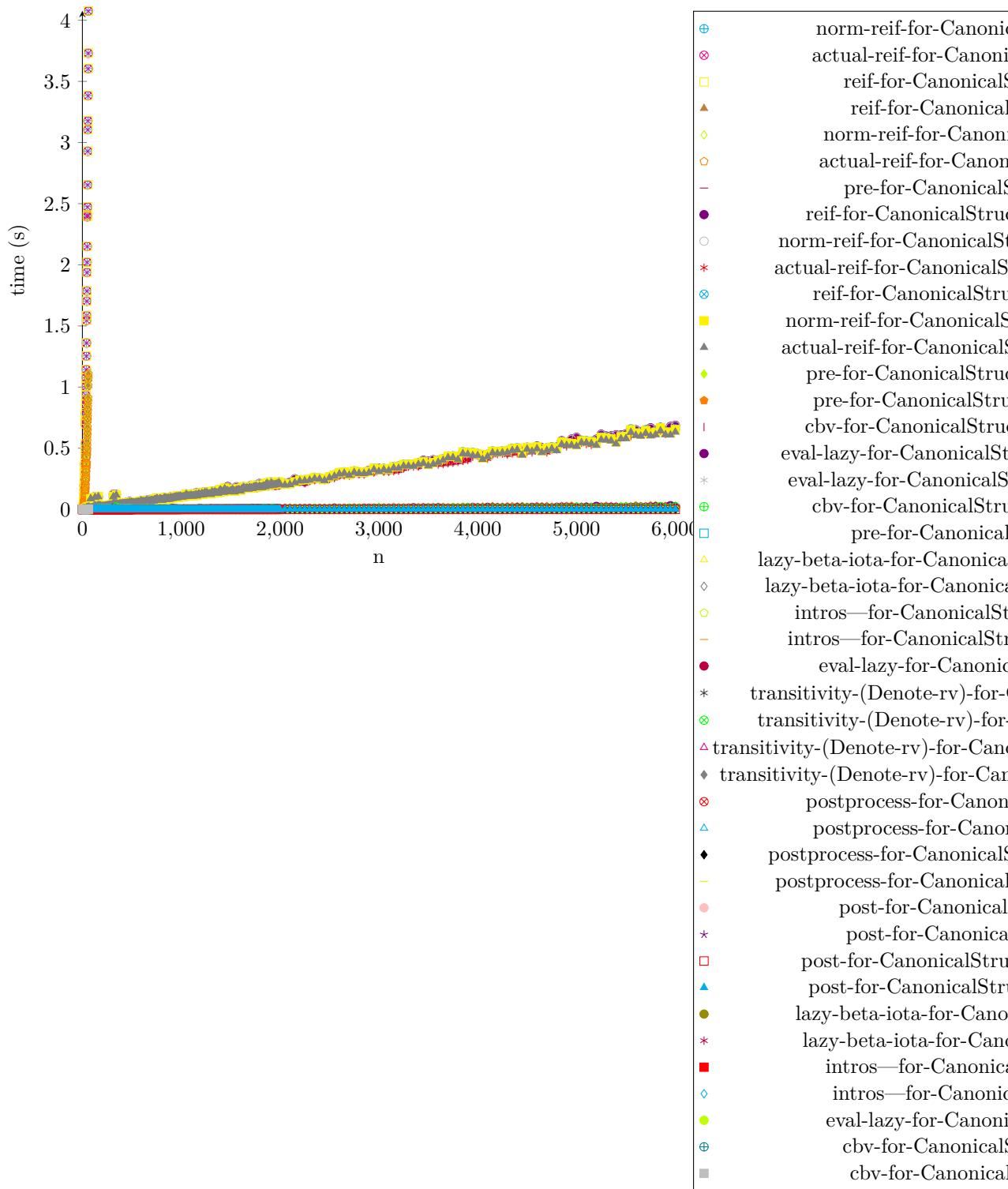
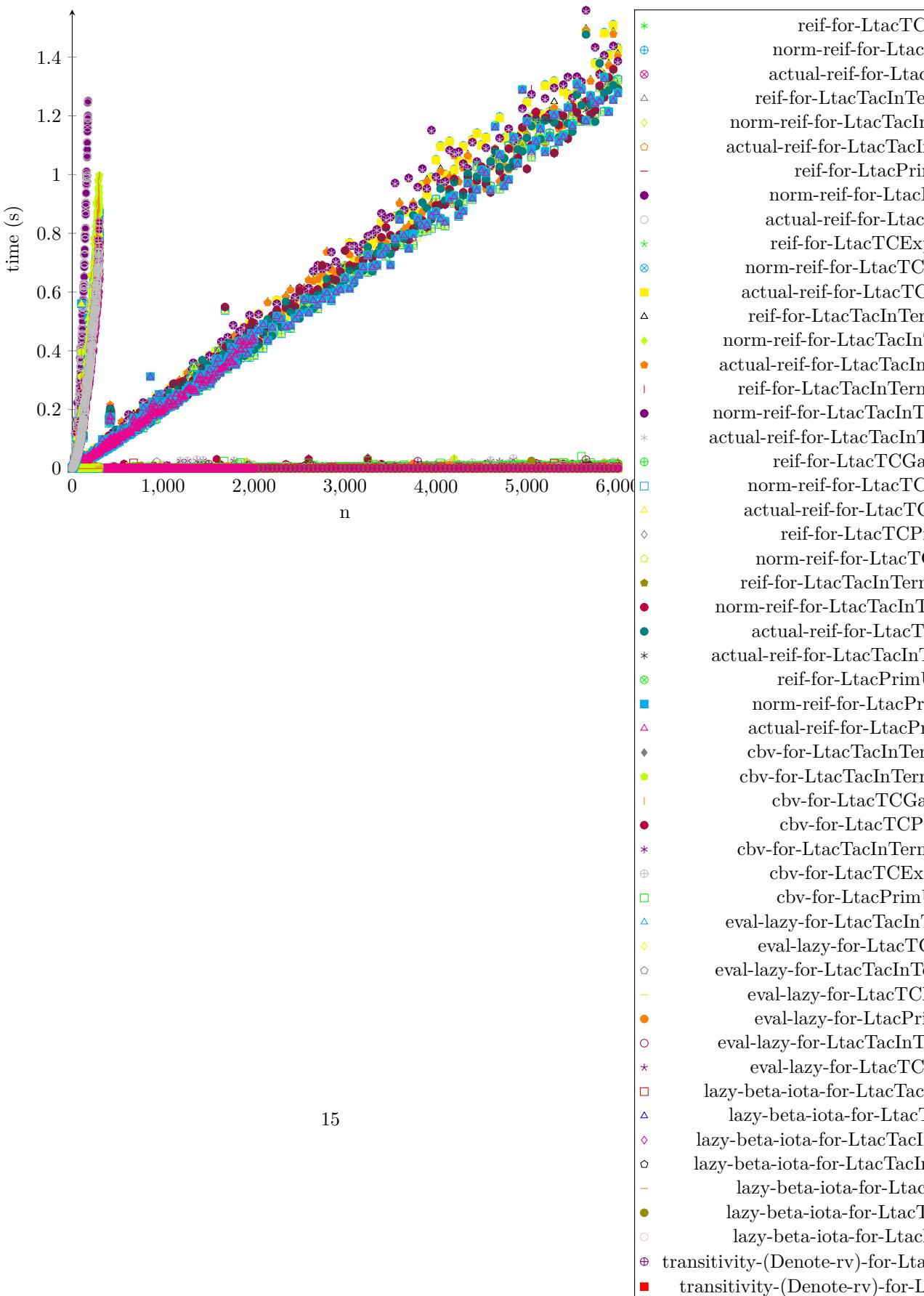


Figure 14: timing-Reify¹⁴/CanonicalStructures



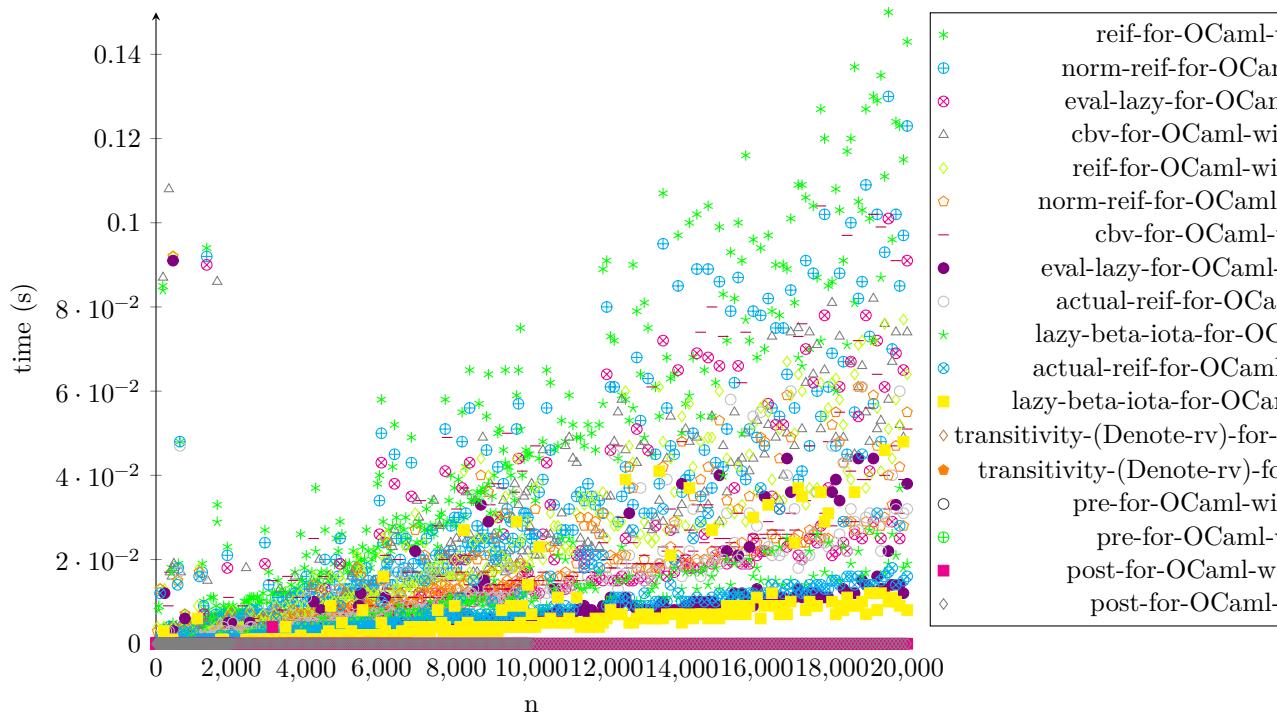
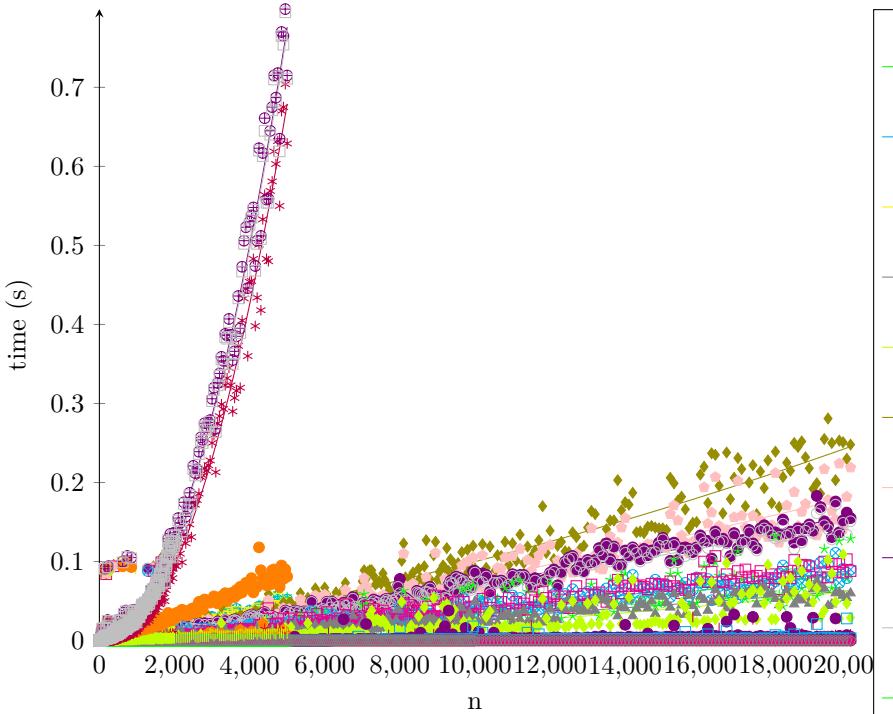


Figure 16: timing-Reify/OCaml



* reif-for-beta-Parametrization
 $5.99 \cdot 10^{-11} \cdot x^2 + 9.27 \cdot 10^{-12} \cdot x^2 + 6.05$
 + norm-reif-for-beta-Parametrization
 $4.07 \cdot 10^{-11} \cdot x^2 + 9.27 \cdot 10^{-12} \cdot x^2 + 6.05$
 □ actual-reif-for-beta-Parametrization
 $5.81 \cdot 10^{-11} \cdot x^2 + 8.21 \cdot 10^{-11} \cdot x^2 + 6.05$
 △ lazy-beta-iota-for-beta-Parametrization
 $1.03 \cdot 10^{-10} \cdot x^2 - 5.66 \cdot 10^{-11} \cdot x^2 + 3.05 \cdot 10^{-11} \cdot x^2 + 6.05$
 ◇ eval-lazy-for-beta-Parametrization
 $5.66 \cdot 10^{-11} \cdot x^2 + 3.05 \cdot 10^{-11} \cdot x^2 + 6.05$
 ♦ reif-for-Parametrization
 $2.33 \cdot 10^{-10} \cdot x^2 + 7.77 \cdot 10^{-11} \cdot x^2 + 6.05$
 ▨ norm-reif-for-Parametrization
 $1.35 \cdot 10^{-10} \cdot x^2 + 6.77 \cdot 10^{-11} \cdot x^2 + 6.05$
 ● reif-for-Parametricity
 $8.21 \cdot 10^{-11} \cdot x^2 + 6.77 \cdot 10^{-11} \cdot x^2 + 6.05$
 ○ norm-reif-for-Parametricity
 $7.77 \cdot 10^{-11} \cdot x^2 + 6.77 \cdot 10^{-11} \cdot x^2 + 6.05$
 * eval-lazy-for-Parametricity
 $6.87 \cdot 10^{-11} \cdot x^2 + 2.05 \cdot 10^{-11} \cdot x^2 + 6.05$
 + actual-reif-for-Parametricity
 $4.71 \cdot 10^{-11} \cdot x^2 + 4.71 \cdot 10^{-11} \cdot x^2 + 6.05$
 □ actual-reif-for-Parametricity
 $6.56 \cdot 10^{-11} \cdot x^2 + 4.71 \cdot 10^{-11} \cdot x^2 + 6.05$
 ▲ eval-lazy-for-Parametricity
 $3.05 \cdot 10^{-11} \cdot x^2 + 2.05 \cdot 10^{-11} \cdot x^2 + 6.05$
 ◇ lazy-beta-iota-for-Parametricity
 $1.01 \cdot 10^{-10} \cdot x^2 + 1.01 \cdot 10^{-11} \cdot x^2 + 6.05$
 ♦ cbv-for-beta-Parametrization
 $1.73 \cdot 10^{-10} \cdot x^2 + 1.01 \cdot 10^{-11} \cdot x^2 + 6.05$
 | cbv-for-Parametricity
 $1.01 \cdot 10^{-11} \cdot x^2 + 2.05 \cdot 10^{-11} \cdot x^2 + 6.05$
 ● cbv-for-Parametrization
 $1.11 \cdot 10^{-11} \cdot x^2 + 2.05 \cdot 10^{-11} \cdot x^2 + 6.05$
 * lazy-beta-iota-for-beta-Parametrization
 $5.9 \cdot 10^{-11} \cdot x^2 + 8.21 \cdot 10^{-11} \cdot x^2 + 6.05$
 □ lazy-beta-iota-for-Parametrization
 $9.27 \cdot 10^{-12} \cdot x^2 + 6.05$
 ◇ transitivity-(Denote-rv)-for-beta-Parametrization
 $9.27 \cdot 10^{-12} \cdot x^2 + 6.05$
 ♦ transitivity-(Denote-rv)-for-beta-Parametrization
 $9.27 \cdot 10^{-12} \cdot x^2 + 6.05$
 * transitivity-(Denote-rv)-for-beta-Parametrization
 $9.27 \cdot 10^{-12} \cdot x^2 + 6.05$
 ▲ transitivity-(Denote-rv)-for-beta-Parametrization
 $9.27 \cdot 10^{-12} \cdot x^2 + 6.05$
 ◆ transitivity-(Denote-rv)-for-beta-Parametrization
 $9.27 \cdot 10^{-12} \cdot x^2 + 6.05$
 ● transitivity-(Denote-rv)-for-beta-Parametrization
 $9.27 \cdot 10^{-12} \cdot x^2 + 6.05$
 * pre-for-beta-Parametrization
 $9.27 \cdot 10^{-12} \cdot x^2 + 6.05$
 □ pre-for-beta-Parametrization
 $9.27 \cdot 10^{-12} \cdot x^2 + 6.05$
 ▲ pre-for-beta-Parametrization
 $9.27 \cdot 10^{-12} \cdot x^2 + 6.05$

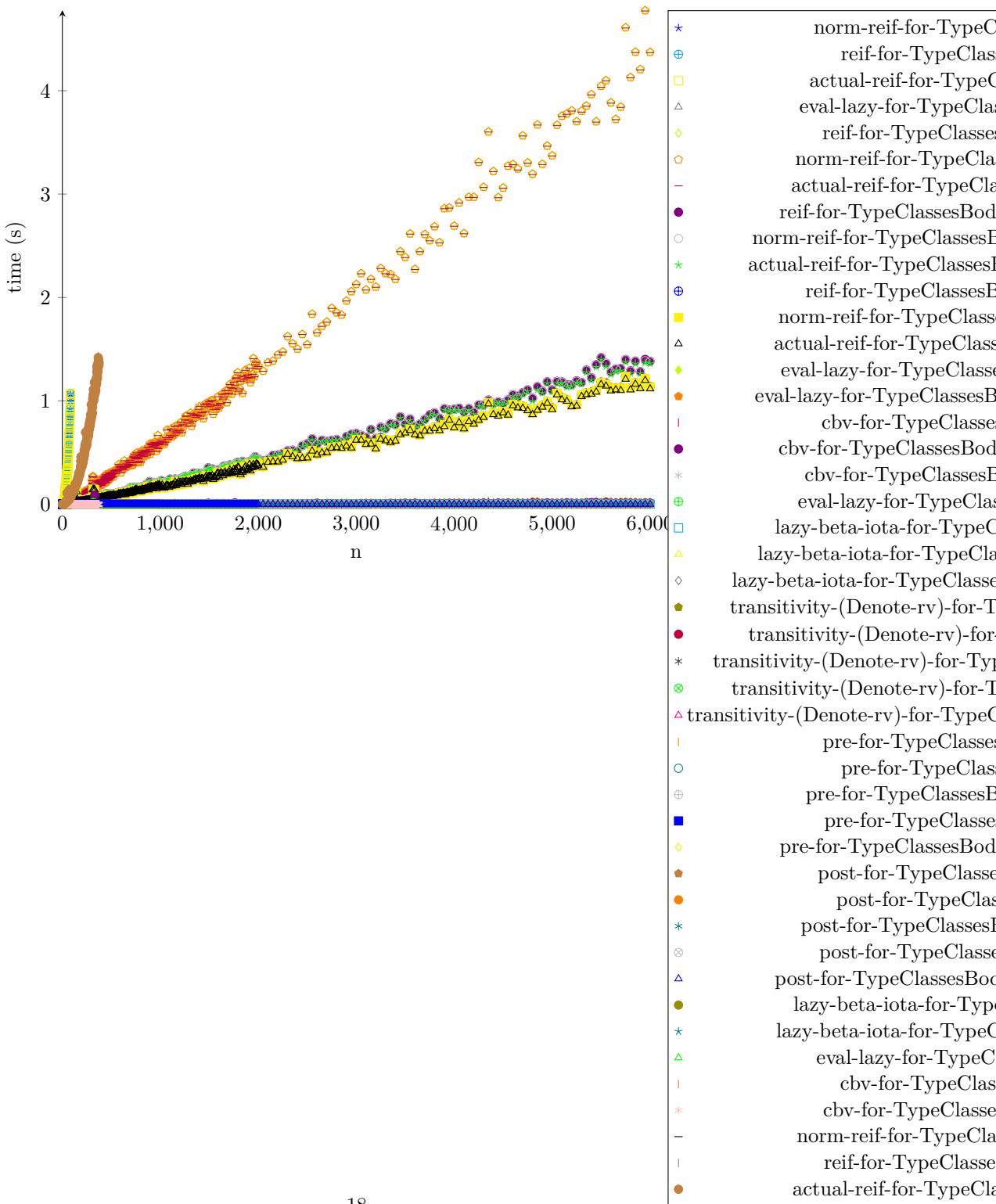


Figure 18: timing-Reify/TypeClasses

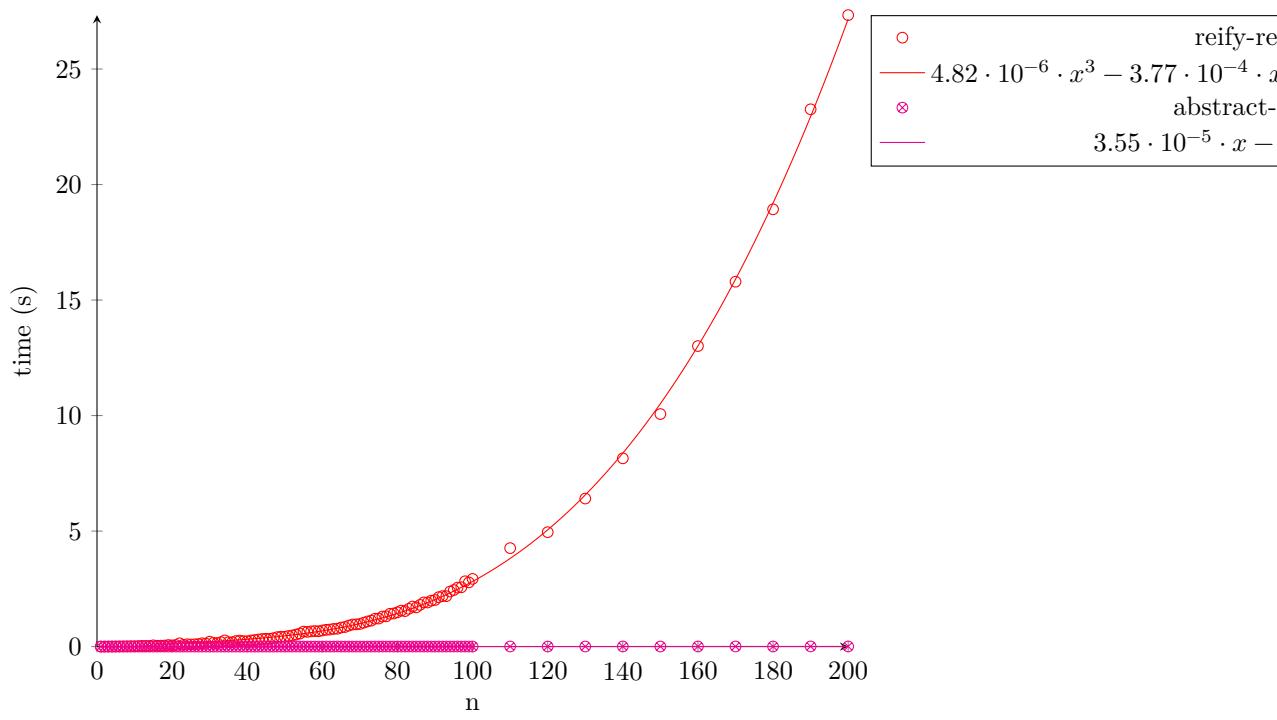


Figure 19: timing-typeclass-reification-let-in-HOAS

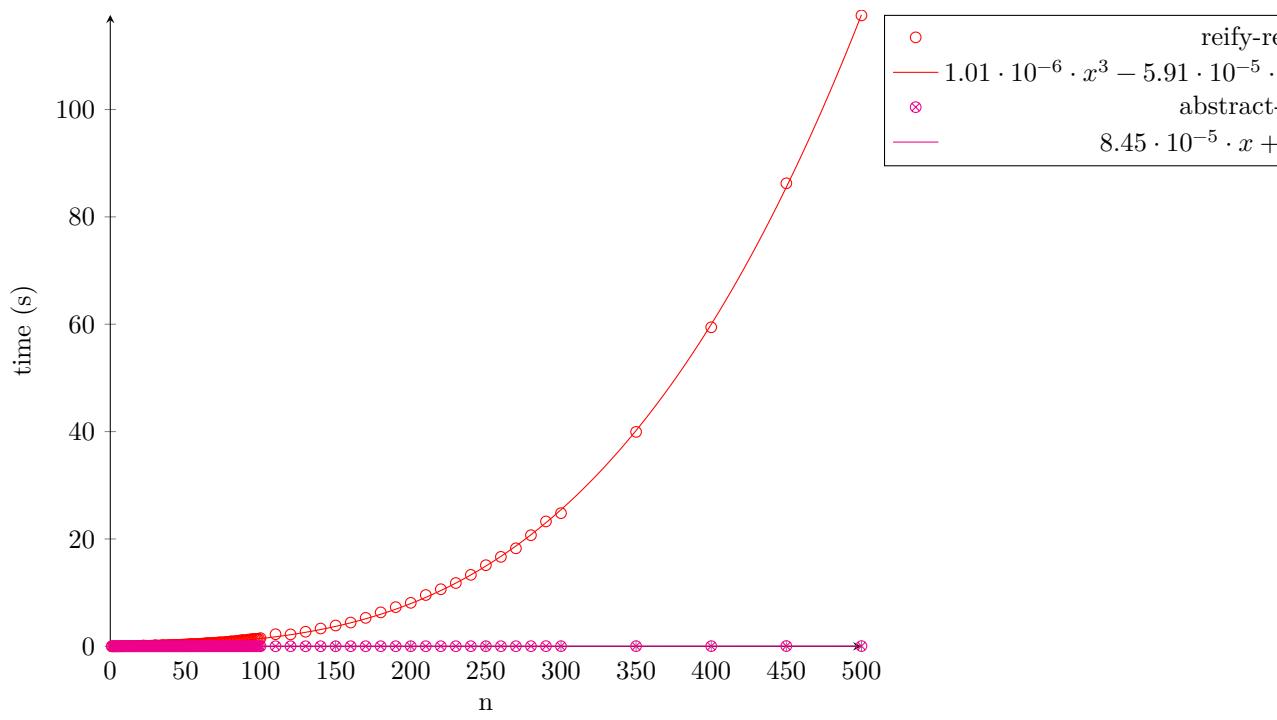


Figure 20: timing-typeclass-reification-let-in-PHOAS

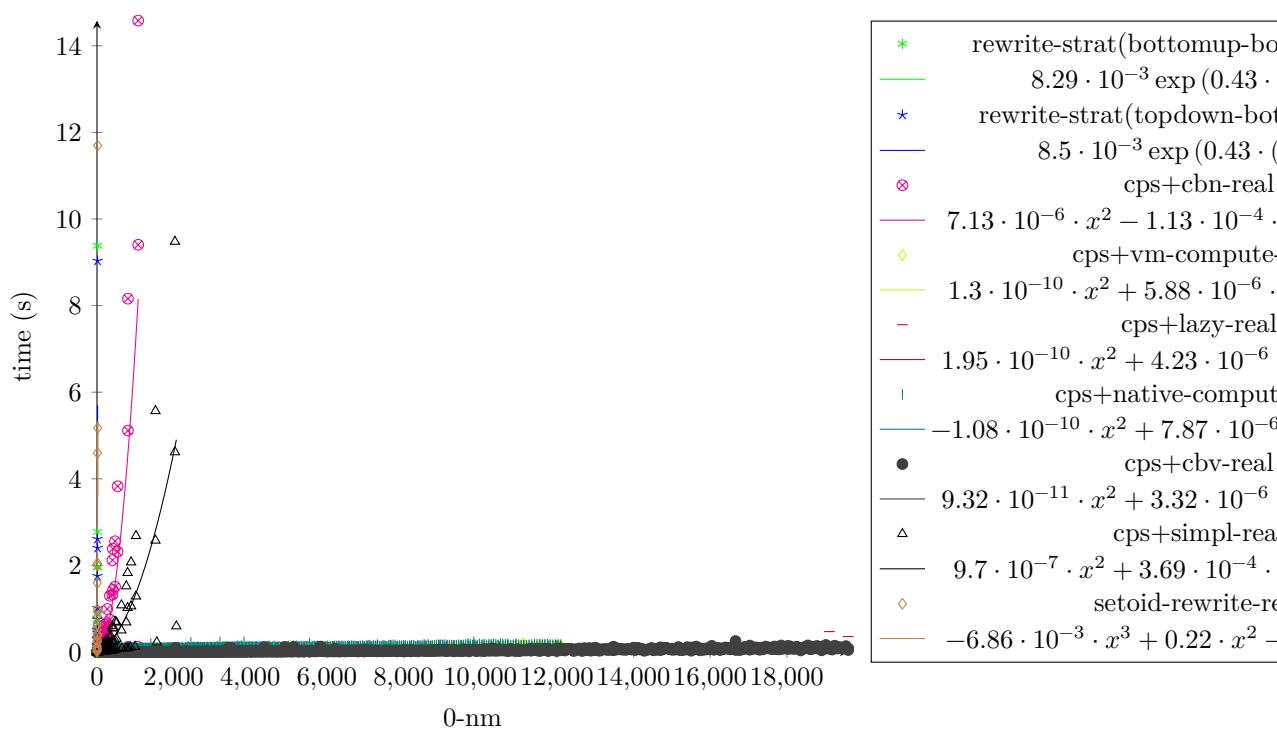


Figure 21: timing-rewrite-lift-lets-map param-1-n 1, param-2-m 1

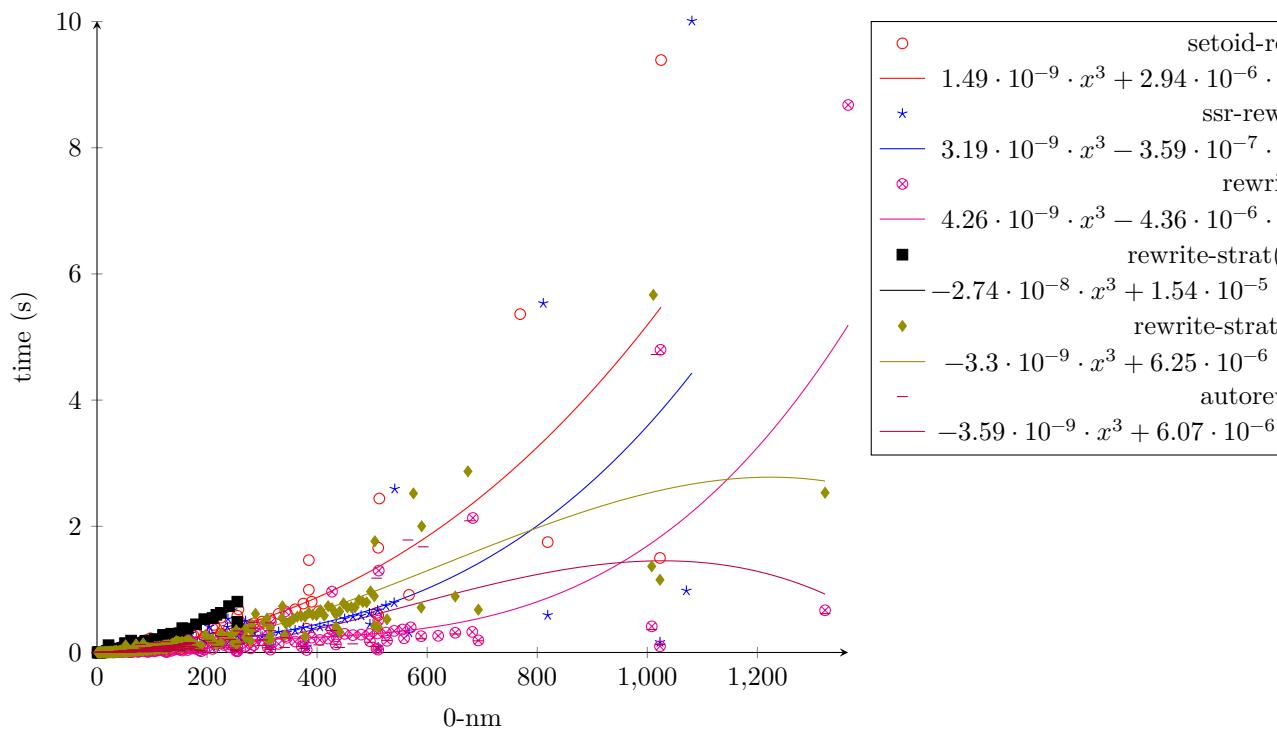


Figure 22: timing-rewrite-plus-0-tree param-1-n 0, param-2-m 1, param-3-input-size 5, param-4-output-size 3, param-5-num-rewrites 1

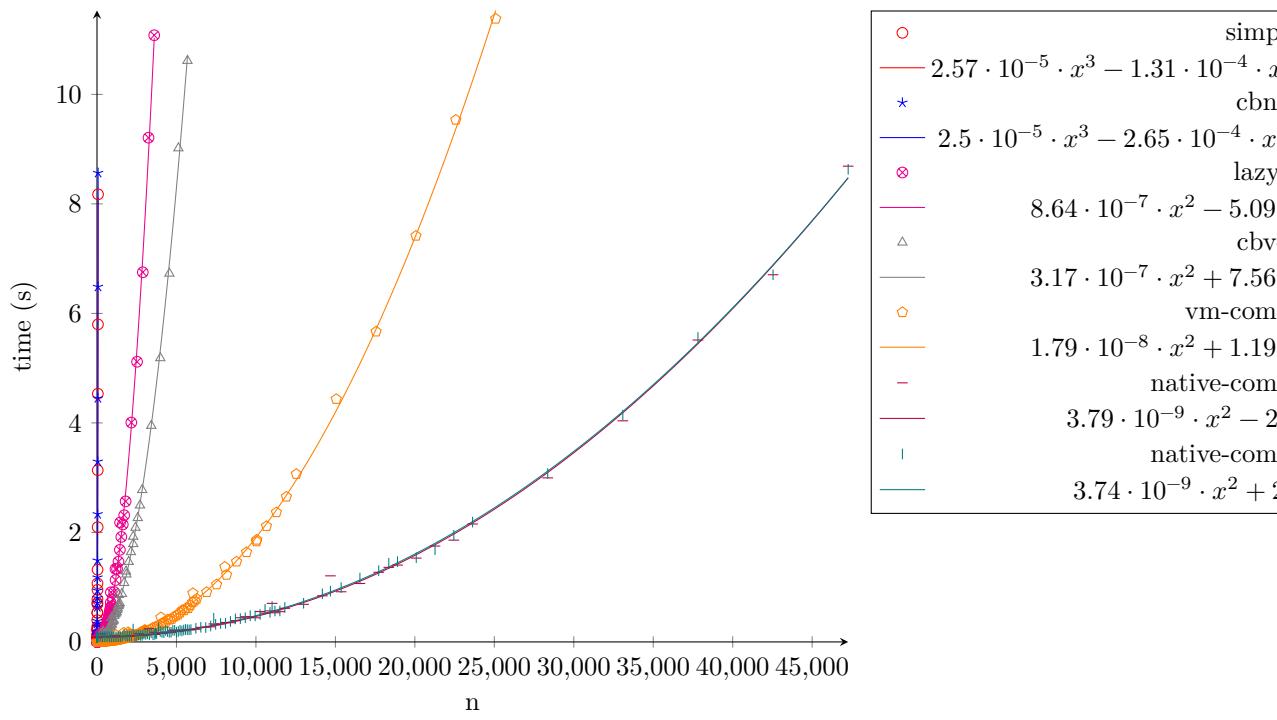


Figure 23: timing-sieve-of-eratosthenes

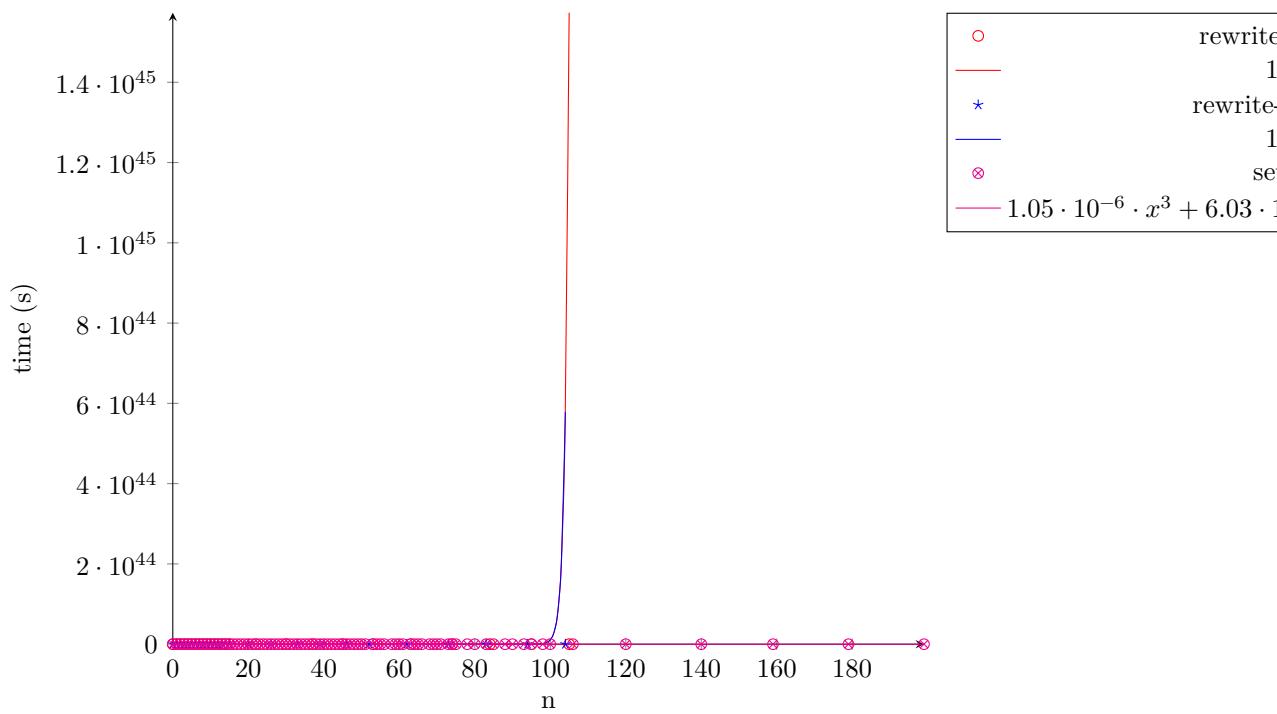


Figure 24: timing-rewrite-under-lets-plus-0

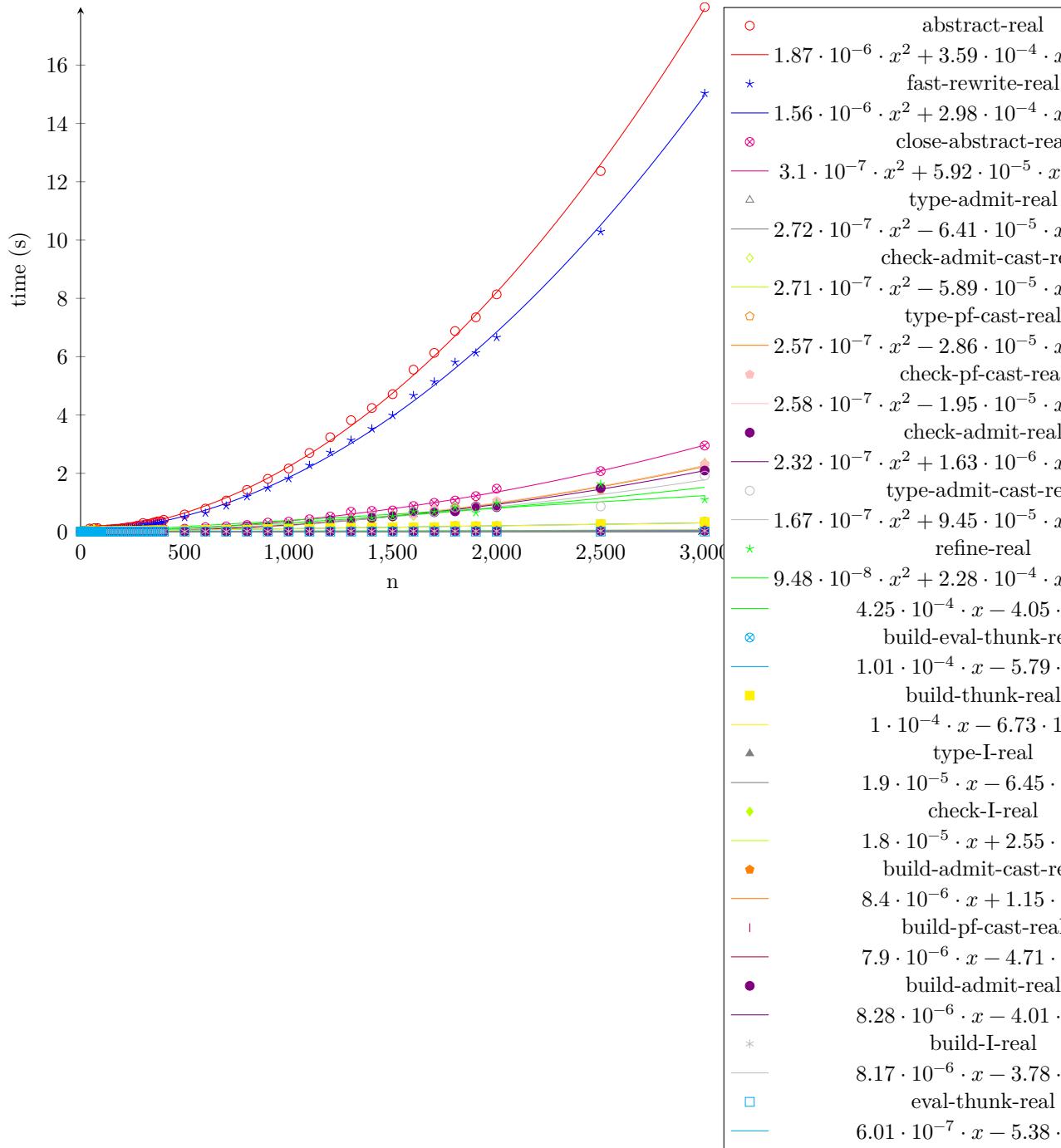


Figure 25: timing-rewrite-repeated-app-fast-rewrite-ltac2

