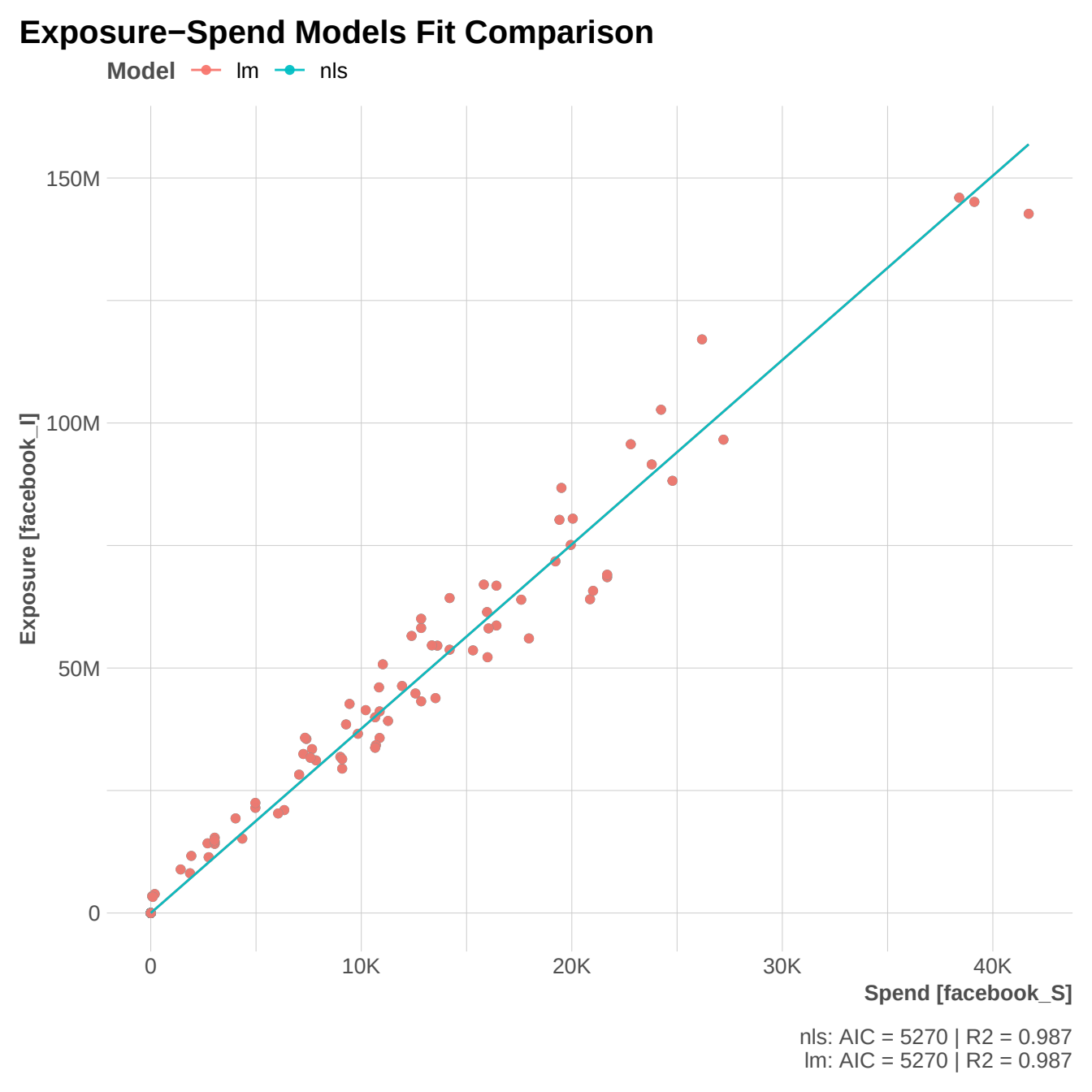
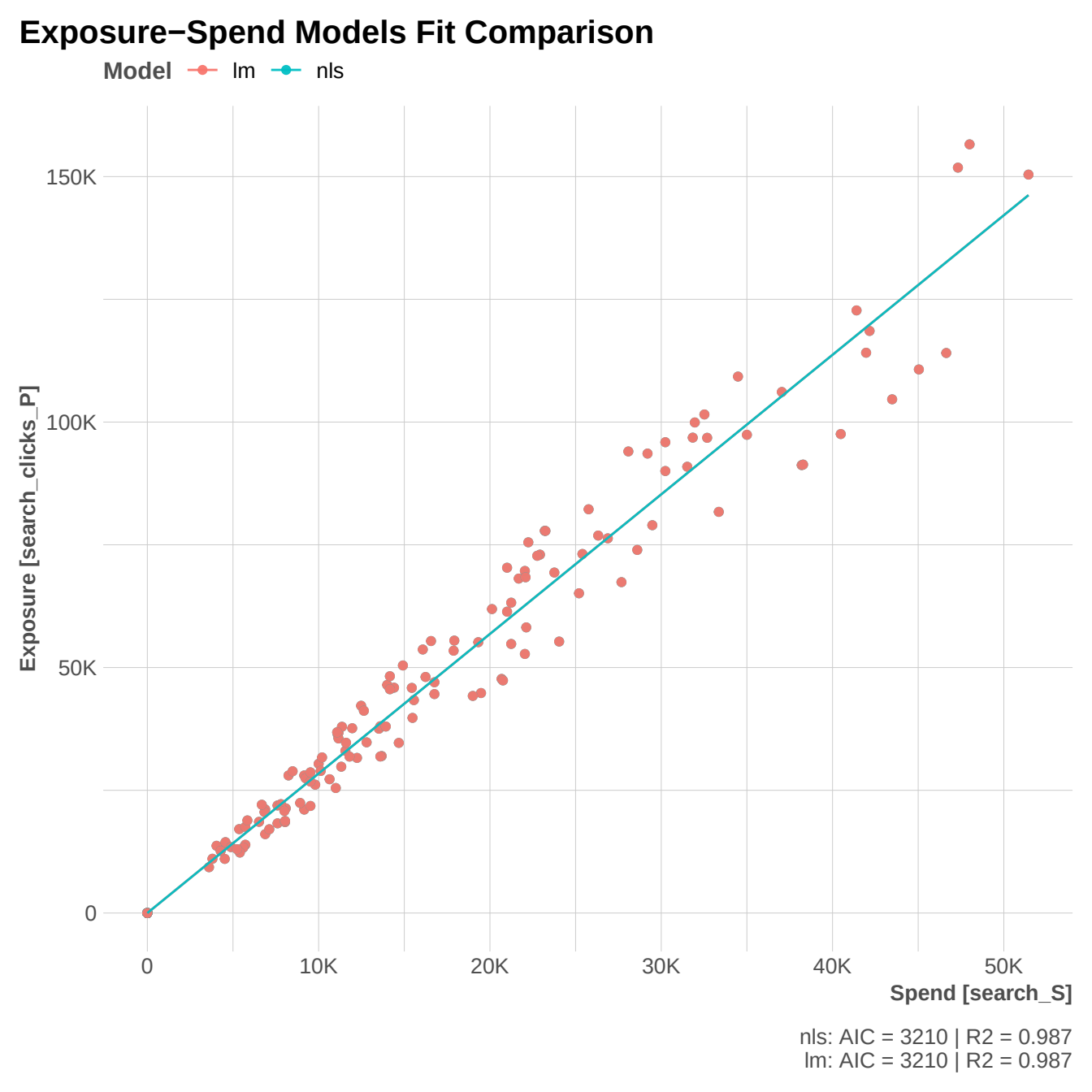
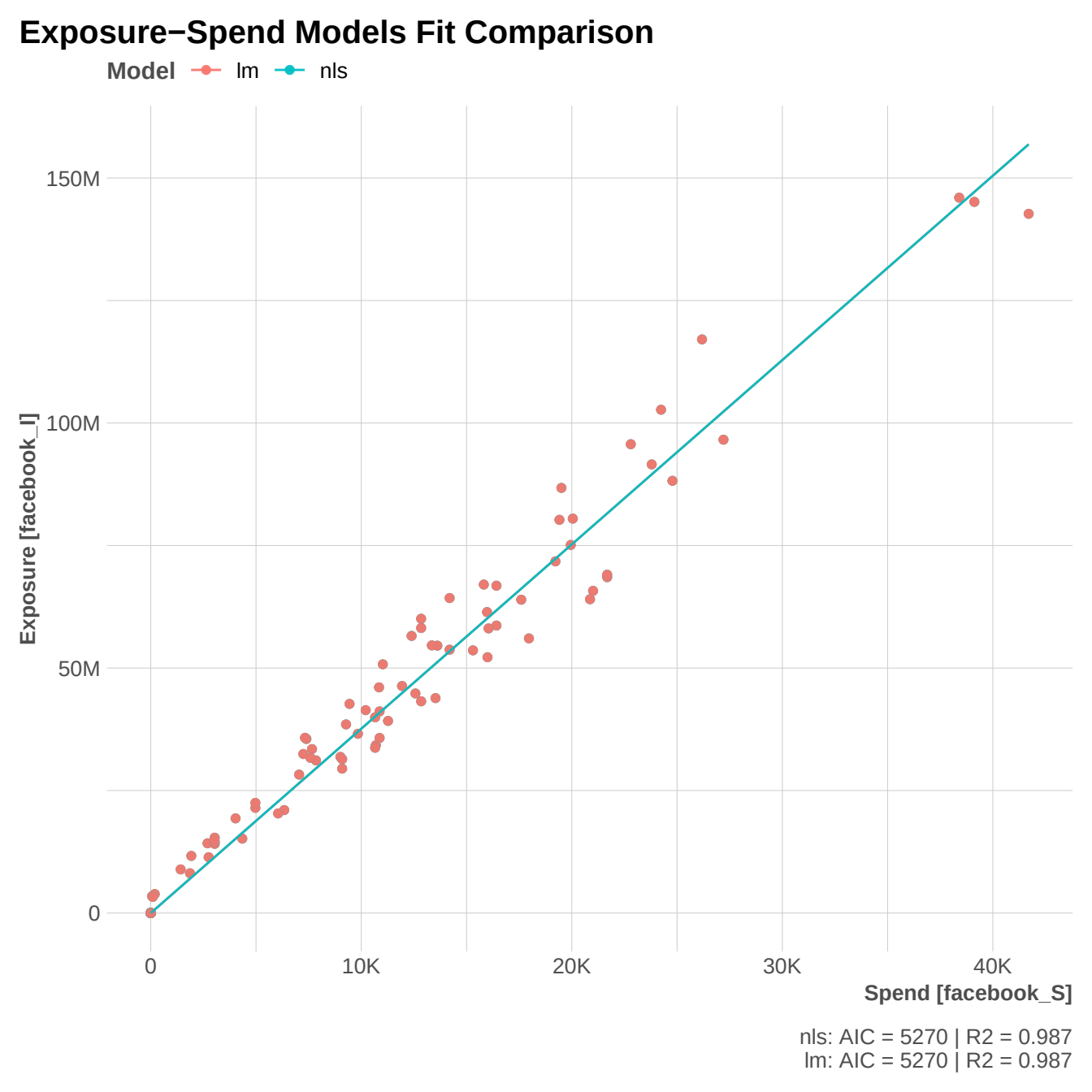
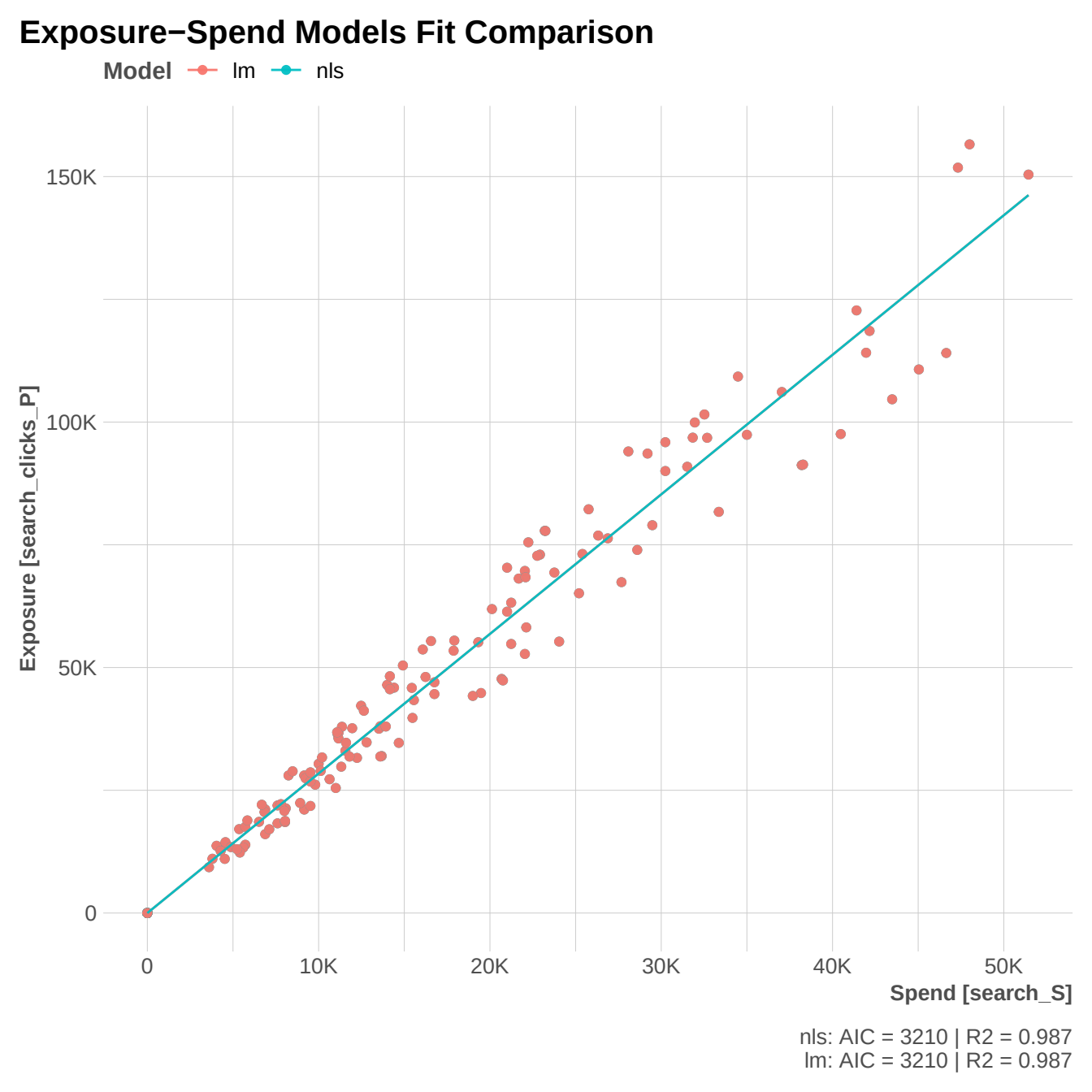

Exposure−Spend Models Fit Comparison
Model
lm
nls
150M
100M
50M
0
Exposure [facebook_I]
0
10K
20K
30K
40K
Spend [facebook_S]
nls: AIC = 5270 | R2 = 0.987
lm: AIC = 5270 | R2 = 0.987


Exposure−Spend Models Fit Comparison
Model
lm
nls
150K
100K
50K
0
Exposure [search_clicks_P]
0
10K
20K
30K
40K
50K
Spend [search_S]
nls: AIC = 3210 | R2 = 0.987
lm: AIC = 3210 | R2 = 0.987


Exposure−Spend Models Fit Comparison
Model
lm
nls
150M
100M
50M
0
Exposure [facebook_I]
0
10K
20K
30K
40K
Spend [facebook_S]
nls: AIC = 5270 | R2 = 0.987
lm: AIC = 5270 | R2 = 0.987


Exposure−Spend Models Fit Comparison
Model
lm
nls
150K
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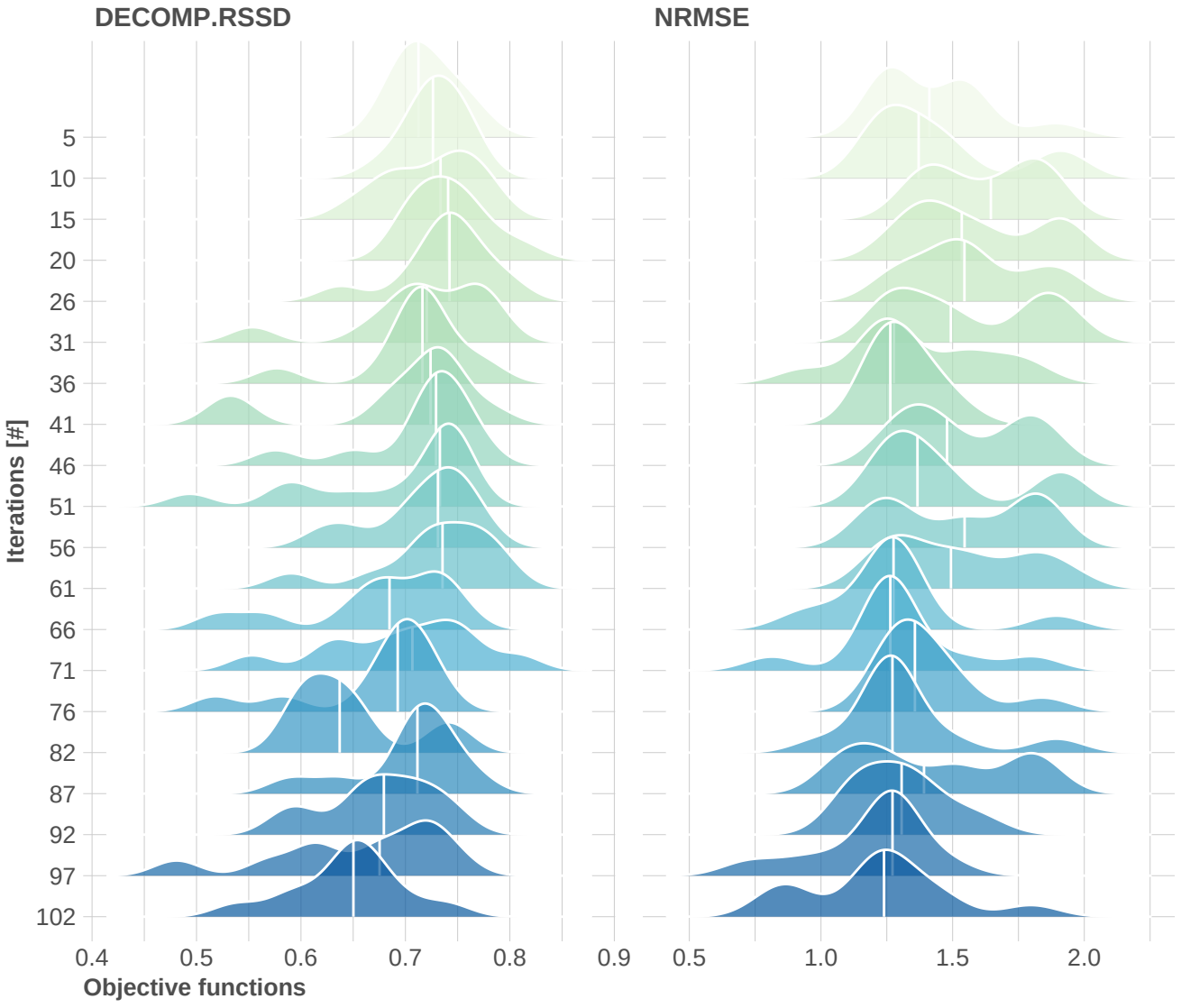
50K
0
Exposure [search_clicks_P]
0
10K
20K
30K
40K
50K
Spend [search_S]
nls: AIC = 3210 | R2 = 0.987
lm: AIC = 3210 | R2 = 0.987

Objective convergence by iterations quantiles

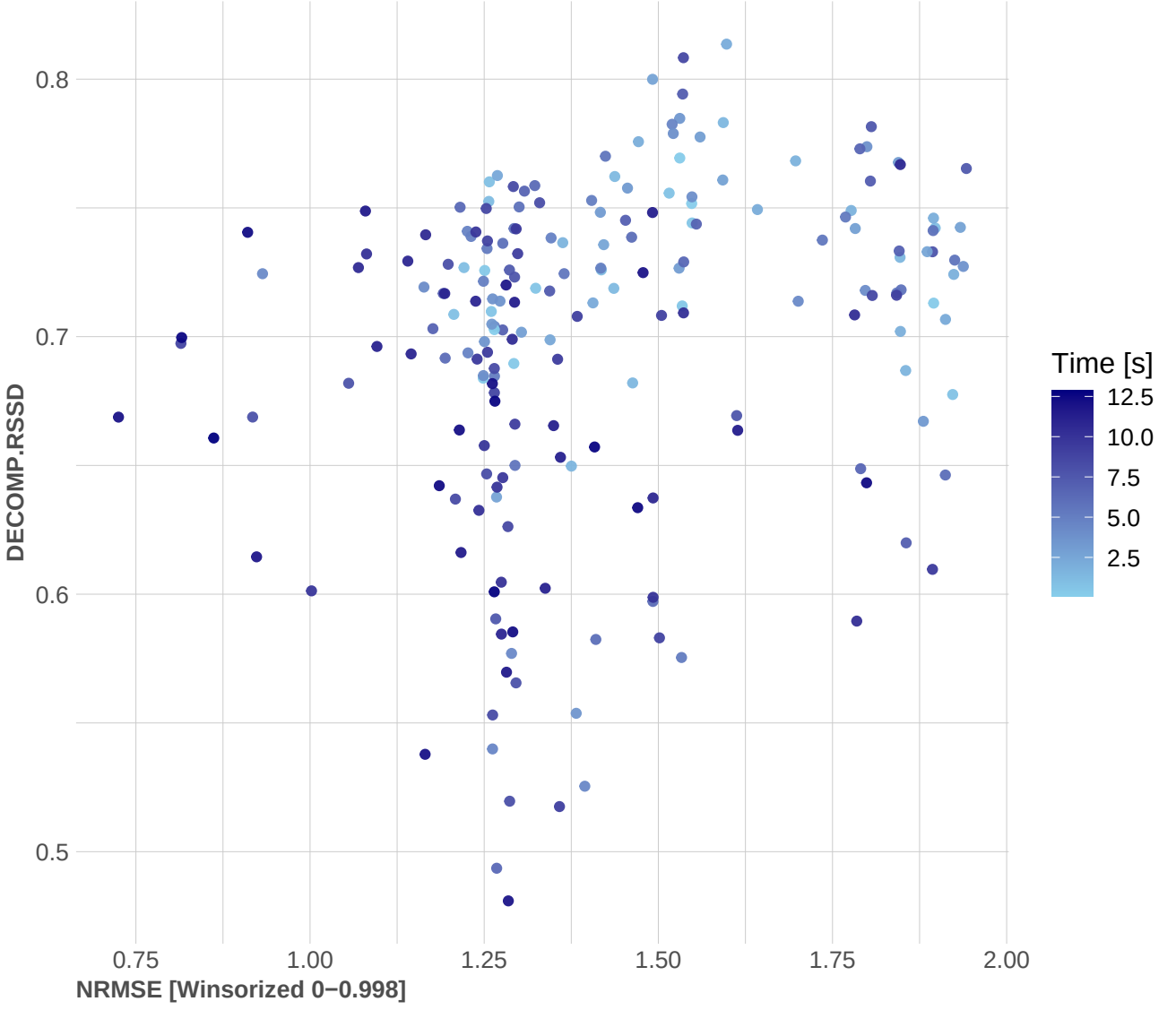
2 trials with 102 iterations each using TwoPointsDE



DECOMP.RSSD NOT converged: sd@qt.20 0.053 > 0.032 & |med@qt.20| 0.65 > 0.65
NRMSE NOT converged: sd@qt.20 0.28 > 0.23 & |med@qt.20| 1.2 > 0.96

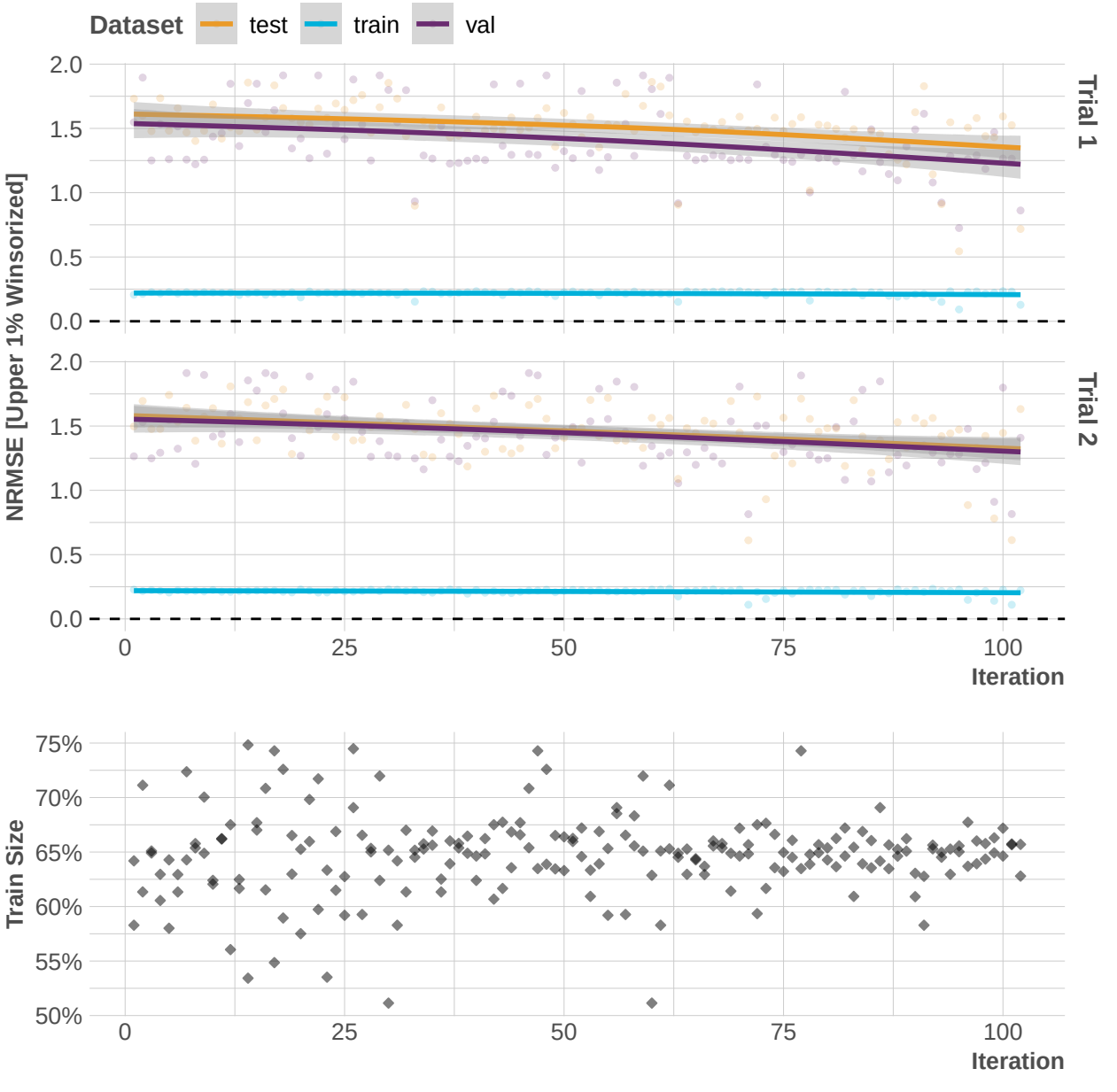
Multi−objective evolutionary performance

2 trials with 102 iterations each using TwoPointsDE



DECOMP.RSSD NOT converged: sd@qt.20 0.053 > 0.032 & |med@qt.20| 0.65 > 0.65
NRMSE NOT converged: sd@qt.20 0.28 > 0.23 & |med@qt.20| 1.2 > 0.96

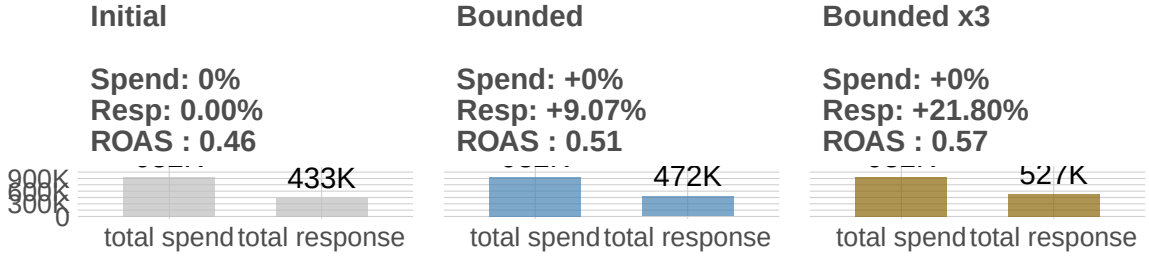
Time−series validation & Convergence



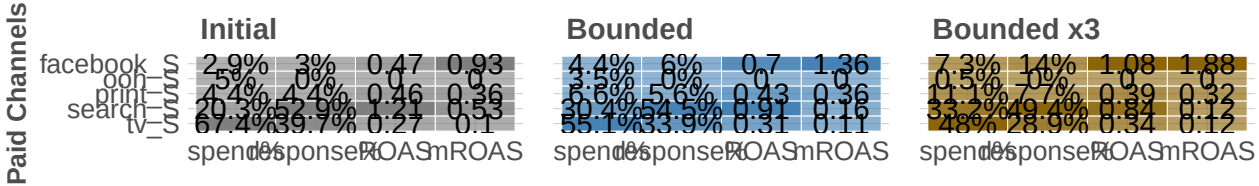
Budget Allocation Onepager for Model ID 2_65_1

Adj.R2: train = 0.0963, val = 0.0313, test = 0.0034 | NRMSE: train = 0.2181, val = 1.1
Simulation date range: 2018−12−10 to 2018−12−31 (4 weeks) | Scenario: max_respo

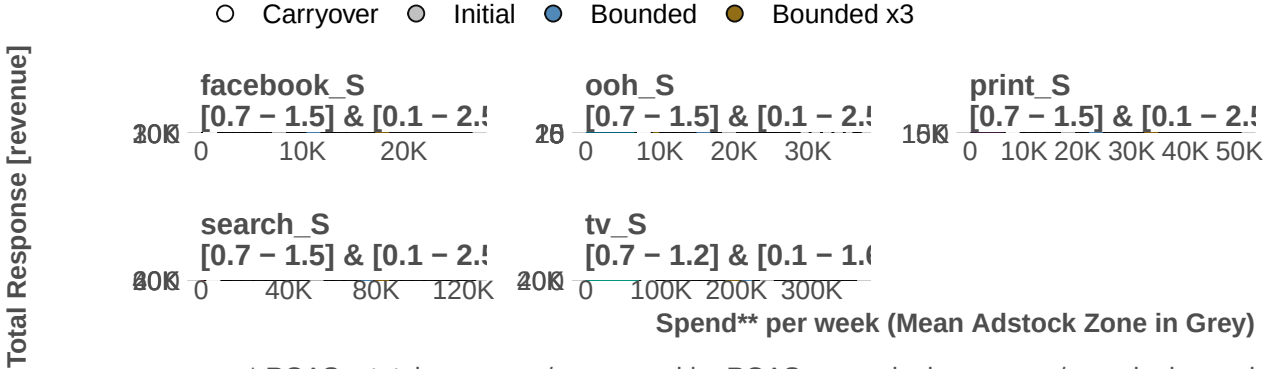
Total Budget Optimization Result



Budget Allocation per Channel*



Simulated Response Curve for Selected Allocation Period



* ROAS = total response / raw spend | mROAS = marginal response / marginal spend
* When reallocating budget, mROAS converges across media within respective bounds
** Dotted lines show budget optimization lower−upper ranges per media