Lansing dataset

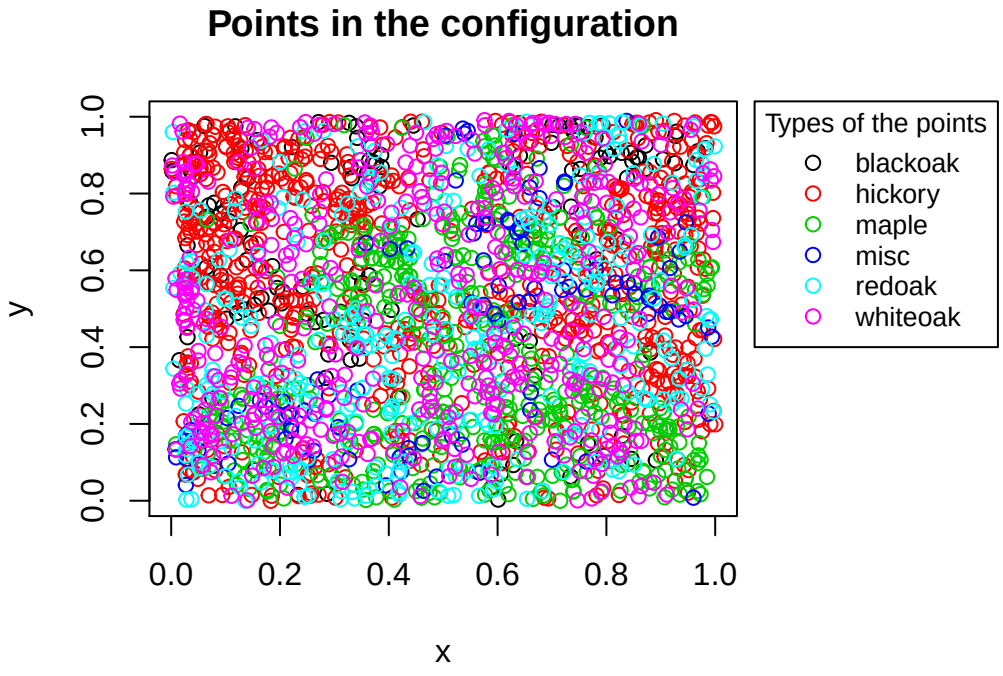
```
library(ppjsdm)
library(spatstat)
#> Loading required package: spatstat.data
#> Loading required package: nlme
#> Loading required package: rpart
#>
#> spatstat 1.63-0       (nickname: 'Space camouflage')
#> For an introduction to spatstat, type 'beginner'
remove(list = ls())

set.seed(1)
```

This vignette explains how to use the `ppjsdm` package with the Lansing dataset from `spatstat`. We begin by loading the data with all species.

```
data(lansing)
configuration <- as.Configuration(lansing)
window <- Rectangle_window(c(0, 1), c(0, 1))
```

The point configuration is plotted below.

```
par(mar = c(5, 4, 4, 13) + 0.1)
plot(configuration, window = window)
```

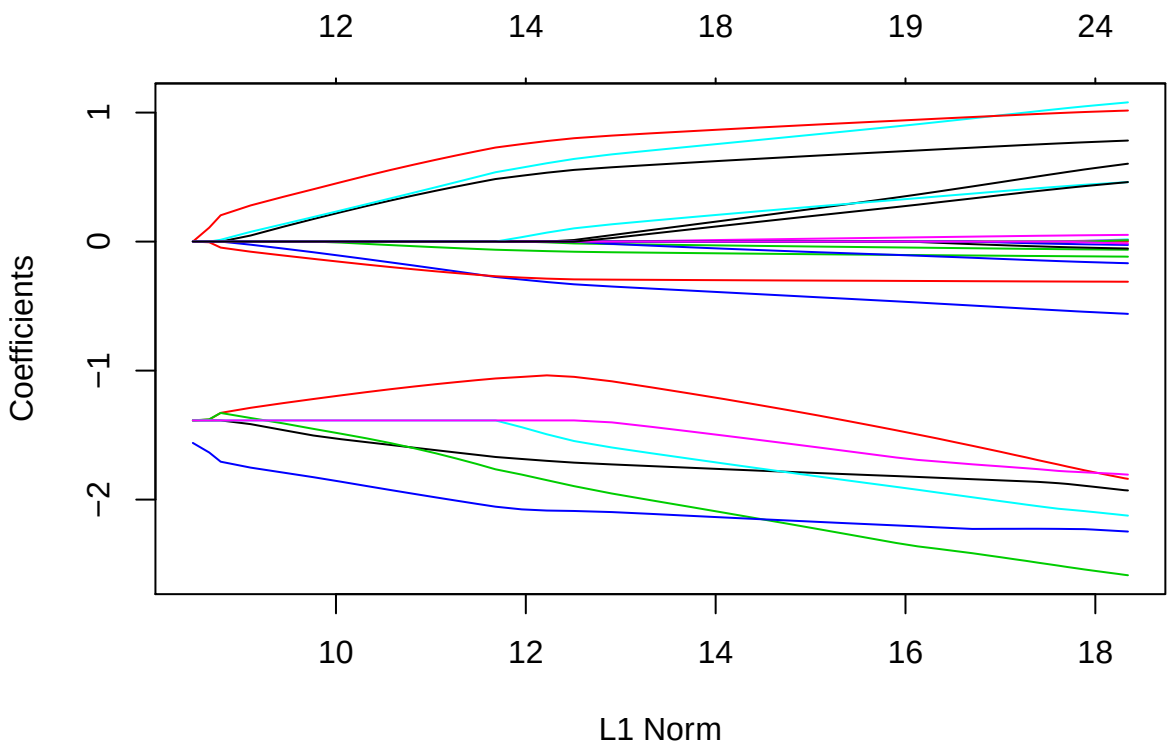


We fit the data with the Geyer model.

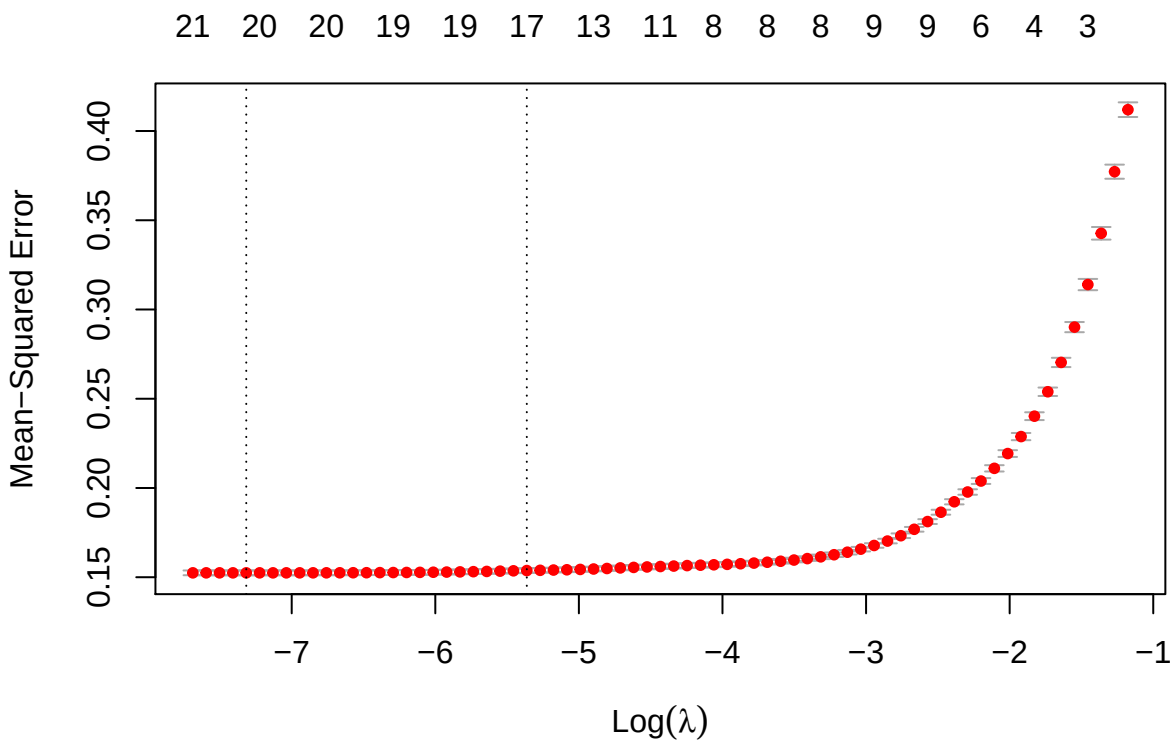
```
radii <- matrix(0.05, 6, 6)
```

The matrix `radii` models interaction radii within a species, and between species.

```
fit <- ppjsdm::gibbsm(configuration,
                      window = window,
                      model = "Geyer",
                      radius = radii,
                      use_glmnet = TRUE)
#> 28 x 1 sparse Matrix of class "dgCMatrix"
#>                          1
#> (Intercept)  .
#> log_lambda1  4.362448697
#> log_lambda2  6.102477812
#> log_lambda3  5.042221358
#> log_lambda4  3.967071845
#> log_lambda5  5.108543141
#> log_lambda6  5.684656013
#> alpha_1_1    0.783225895
#> alpha_1_2   -0.000340953
#> alpha_1_3   -0.116948070
#> alpha_1_4   -0.560425485
#> alpha_1_5    0.017151731
#> alpha_1_6    0.011622290
#> alpha_2_2    0.603679361
#> alpha_2_3   -0.311224865
#> alpha_2_4   -0.063374025
#> alpha_2_5    .
#> alpha_2_6   -0.167808324
#> alpha_3_3    1.079311454
#> alpha_3_4    0.052032502
#> alpha_3_5    .
#> alpha_3_6   -0.053830404
#> alpha_4_4    1.015970724
#> alpha_4_5    0.011096244
#> alpha_4_6   -0.025865592
#> alpha_5_5    0.460942997
#> alpha_5_6   -0.014691249
#> alpha_6_6    0.461365850
plot(fit$complete)
```




```
plot(fit$cv)
```




```
print(coefficients(fit$complete))
#> 28 x 48 sparse Matrix of class "dgCMatrix"
#>    [[ suppressing 48 column names 's0', 's1', 's2' ... ]]
#>
#> (Intercept)          .          .           .           .           .
#> shifted_log_lambda1 -1.386294 -1.386294361 -1.38629436 -1.41492719 -1.46074227
#> shifted_log_lambda2 -1.386294 -1.379903614 -1.32778795 -1.28835740 -1.25234431
#> shifted_log_lambda3 -1.386294 -1.377642454 -1.32838931 -1.36744917 -1.40886417
#> shifted_log_lambda4 -1.560648 -1.634949302 -1.70610755 -1.75202957 -1.79030805
#> shifted_log_lambda5 -1.386294 -1.386294361 -1.38629436 -1.38629436 -1.38629436
#> shifted_log_lambda6 -1.386294 -1.386294361 -1.38629436 -1.38629436 -1.38629436
#> alpha_1_1            .          .           .           0.04702823  0.11446758
#> alpha_1_2            .          .           .           .           .
#> alpha_1_3            .          .           .           .           .
#> alpha_1_4            .          .           .          -0.02401194 -0.05373081
#> alpha_1_5            .          .           .           .           .
#> alpha_1_6            .          .           .           .           .
#> alpha_2_2            .          .           .           .           .
#> alpha_2_3            .         -0.005171702 -0.04645433 -0.07836064 -0.10761912
#> alpha_2_4            .          .           .           .           .
#> alpha_2_5            .          .           .           .           .
#> alpha_2_6            .          .           .           .           .
#> alpha_3_3            .          .           0.01398425  0.07566664  0.13464475
#> alpha_3_4            .          .           .           .           .
#> alpha_3_5            .          .           .           .           .
#> alpha_3_6            .          .           .           .           .
```

```
#> alpha_4_4            .         0.108022019  0.20389894  0.28022920  0.34641722
#> alpha_4_5            .         .            .           .           .
#> alpha_4_6            .         .            .           .           .
#> alpha_5_5            .         .            .           .           .
#> alpha_5_6            .         .            .           .           .
#> alpha_6_6            .         .            .           .           .
#>
#> (Intercept)          .           .            .           .
#> shifted_log_lambda1 -1.50323910 -1.531540445 -1.55442019 -1.57592298
#> shifted_log_lambda2 -1.22025542 -1.192307925 -1.16703636 -1.14435630
#> shifted_log_lambda3 -1.45183381 -1.488956526 -1.52476136 -1.56172478
#> shifted_log_lambda4 -1.82629422 -1.861069912 -1.89425877 -1.92548805
#> shifted_log_lambda5 -1.38629436 -1.386294361 -1.38629436 -1.38629436
#> shifted_log_lambda6 -1.38629436 -1.386294361 -1.38629436 -1.38629436
#> alpha_1_1            0.17508274  0.227731574  0.27498369  0.31800745
#> alpha_1_2            .           .            .           .
#> alpha_1_3            .          -0.007630117 -0.01772626 -0.02711546
#> alpha_1_4           -0.08278564 -0.110056043 -0.13591823 -0.16102463
#> alpha_1_5            .           .            .           .
#> alpha_1_6            .           .            .           .
#> alpha_2_2            .           .            .           .
#> alpha_2_3           -0.13395193 -0.157187983 -0.17827374 -0.19734404
#> alpha_2_4            .           .            .           .
#> alpha_2_5            .           .            .           .
#> alpha_2_6            .           .            .           .
#> alpha_3_3            0.19049733  0.241315018  0.28910994  0.33463976
#> alpha_3_4            .           .            .           .
#> alpha_3_5            .           .            .           .
#> alpha_3_6            .           .            .           .
#> alpha_4_4            0.40593316  0.460155467  0.50960675  0.55469069
#> alpha_4_5            .           .            .           .
#> alpha_4_6            .           .            .           .
#> alpha_5_5            .           .            .           .
#> alpha_5_6            .           .            .           .
#> alpha_6_6            .           .            .           .
#>
#> (Intercept)          .           .            .           .           .
#> shifted_log_lambda1 -1.59702842 -1.6164440 -1.63535263 -1.65276092 -1.66957559
#> shifted_log_lambda2 -1.12381537 -1.1055804 -1.08908984 -1.07434119 -1.06100493
#> shifted_log_lambda3 -1.60078120 -1.6405366 -1.68187802 -1.72301142 -1.76508842
#> shifted_log_lambda4 -1.95489480 -1.9824010 -2.00820701 -2.03229805 -2.05482721
#> shifted_log_lambda5 -1.38629436 -1.3862944 -1.38629436 -1.38629436 -1.38629436
#> shifted_log_lambda6 -1.38629436 -1.3862944 -1.38629436 -1.38629436 -1.38629436
#> alpha_1_1            0.35753259  0.3935452  0.42671891  0.45703164  0.48498721
#> alpha_1_2            .           .          .           .           .
#> alpha_1_3           -0.03551999 -0.0434207 -0.05048857 -0.05712441 -0.06306811
#> alpha_1_4           -0.18526840 -0.2087917 -0.23144026 -0.25329858 -0.27426085
#> alpha_1_5            .           .          .           .           .
#> alpha_1_6            .           .          .           .           .
#> alpha_2_2            .           .          .           .           .
#> alpha_2_3           -0.21467838 -0.2302249 -0.24433189 -0.25705032 -0.26858555
#> alpha_2_4            .           .          .           .           .
#> alpha_2_5            .           .          .           .           .
```

```
#> alpha_2_6             .           .           .           .           .
#> alpha_3_3             0.37867435  0.4206736   0.46139420  0.50012847  0.53764598
#> alpha_3_4             .           .           .           .           .
#> alpha_3_5             .           .           .           .           .
#> alpha_3_6             .           .           .           .           .
#> alpha_4_4             0.59591260  0.6336035   0.66815943  0.69983264  0.72891283
#> alpha_4_5             .           .           .           .           .
#> alpha_4_6             .           .           .           .           .
#> alpha_5_5             .           .           .           .           .
#> alpha_5_6             .           .           .           .           .
#> alpha_6_6             .           .           .           .           .
#>
#> (Intercept)           .           .            .           .
#> shifted_log_lambda1 -1.68504417 -1.699688611 -1.7134394468 -1.72723999
#> shifted_log_lambda2 -1.04901097 -1.036847387 -1.0484534492 -1.08293856
#> shifted_log_lambda3 -1.80625891 -1.849403517 -1.8956927793 -1.95289248
#> shifted_log_lambda4 -2.07581664 -2.084897888 -2.0882427405 -2.09659680
#> shifted_log_lambda5 -1.43896935 -1.493854475 -1.5460267096 -1.59606889
#> shifted_log_lambda6 -1.38629436 -1.386294361 -1.3862193032 -1.40134542
#> alpha_1_1             0.51057144  0.534164085  0.5558781499  0.57605064
#> alpha_1_2             .           .            .           .
#> alpha_1_3            -0.06864520 -0.073845857 -0.0786719407 -0.08265822
#> alpha_1_4            -0.29438040 -0.313338271 -0.3312515847 -0.34839149
#> alpha_1_5             .           .            .           .
#> alpha_1_6             .           .            .           .
#> alpha_2_2             .           .           0.0123862371  0.05024052
#> alpha_2_3            -0.27902539 -0.287205998 -0.2929565261 -0.29502627
#> alpha_2_4             .          -0.005875714 -0.0143560713 -0.01927741
#> alpha_2_5             .           .            .           .
#> alpha_2_6             .           .           -0.0001015625 -0.01805297
#> alpha_3_3             0.57320420  0.607397887  0.6407418740  0.67615150
#> alpha_3_4             .           .            .           .
#> alpha_3_5             .           .            .           .
#> alpha_3_6             .           .            .           .
#> alpha_4_4             0.75560163  0.779549950  0.8013893396  0.82170428
#> alpha_4_5             .           .            .           .
#> alpha_4_6             .           .            .           .
#> alpha_5_5             0.03445016  0.069570210  0.1026493613  0.13405989
#> alpha_5_6             .           .            .           .
#> alpha_6_6             .           .            .           0.02720445
#>
#> (Intercept)           .           .            .           .
#> shifted_log_lambda1 -1.74051047 -1.752998968 -1.76451577 -1.77523768
#> shifted_log_lambda2 -1.13003194 -1.176633649 -1.22129446 -1.26567003
#> shifted_log_lambda3 -2.00563493 -2.055339974 -2.10224853 -2.14712824
#> shifted_log_lambda4 -2.11102724 -2.125448553 -2.13871969 -2.15110979
#> shifted_log_lambda5 -1.64079670 -1.682388235 -1.72107667 -1.75707746
#> shifted_log_lambda6 -1.43593706 -1.470986574 -1.50449175 -1.53665950
#> alpha_1_1             0.59465014  0.611765105  0.62746039  0.64187656
#> alpha_1_2             .           .            .           .
#> alpha_1_3            -0.08588385 -0.088755545 -0.09142383 -0.09384665
#> alpha_1_4            -0.36439359 -0.379481587 -0.39374704 -0.40720185
#> alpha_1_5             .           .            .           .
```

```
#> alpha_1_6             .           .           .           .
#> alpha_2_2             0.09001672  0.127911059  0.16356059  0.19770933
#> alpha_2_3            -0.29655341 -0.297928387 -0.29921276 -0.30031654
#> alpha_2_4            -0.02322887 -0.026849805 -0.03021460 -0.03326071
#> alpha_2_5             .           .           .           .
#> alpha_2_6            -0.03174078 -0.044003718 -0.05518960 -0.06521858
#> alpha_3_3             0.70674611  0.735144076  0.76186569  0.78721989
#> alpha_3_4             0.00418853  0.008655218  0.01271541  0.01644541
#> alpha_3_5             .           .           .           .
#> alpha_3_6             .           .           .           .
#> alpha_4_4             0.83930089  0.855393707  0.87019454  0.88379705
#> alpha_4_5             .           .           .           .
#> alpha_4_6             .           .           .           .
#> alpha_5_5             0.16216967  0.188185491  0.21227570  0.23459412
#> alpha_5_6             .           .           .           .
#> alpha_6_6             0.06119019  0.093752064  0.12420183  0.15261317
#>
#> (Intercept)           .           .           .           .           .
#> shifted_log_lambda1 -1.78511204 -1.79423492 -1.80271993 -1.81050267 -1.81767134
#> shifted_log_lambda2 -1.30793651 -1.34857939 -1.38873352 -1.42655634 -1.46251186
#> shifted_log_lambda3 -2.18935980 -2.22924153 -2.26727193 -2.30277174 -2.33607263
#> shifted_log_lambda4 -2.16249370 -2.17300469 -2.18282103 -2.19180940 -2.20008385
#> shifted_log_lambda5 -1.79047488 -1.82144437 -1.85017948 -1.87672575 -1.90125851
#> shifted_log_lambda6 -1.56714182 -1.59599301 -1.62350024 -1.64933176 -1.67356891
#> alpha_1_1             0.65509156  0.66721047  0.67833571  0.68852172  0.69785306
#> alpha_1_2             .           .           .           .           .
#> alpha_1_3            -0.09609094 -0.09815071 -0.10000842 -0.10173169 -0.10331199
#> alpha_1_4            -0.41986435 -0.43175425 -0.44289538 -0.45331497 -0.46304079
#> alpha_1_5             .           .           .           .           .
#> alpha_1_6             .           .           .           .           .
#> alpha_2_2             0.22976666  0.26001312  0.28898778  0.31603876  0.34142537
#> alpha_2_3            -0.30134675 -0.30227802 -0.30306037 -0.30379745 -0.30446603
#> alpha_2_4            -0.03608619 -0.03868177 -0.04101281 -0.04317361 -0.04515684
#> alpha_2_5             .           .           .           .           .
#> alpha_2_6            -0.07437402 -0.08268773 -0.09012861 -0.09693251 -0.10312403
#> alpha_3_3             0.81102001  0.83340252  0.85457944  0.87432758  0.89279822
#> alpha_3_4             0.01983806  0.02293678  0.02578978  0.02838102  0.03074650
#> alpha_3_5             .           .           .           .           .
#> alpha_3_6             .           .           .           .           .
#> alpha_4_4             0.89629569  0.90777467  0.91830975  0.92797813  0.93684644
#> alpha_4_5             .           .           .           .           .
#> alpha_4_6             .           .           .           .           .
#> alpha_5_5             0.25522085  0.27428032  0.29190311  0.30813869  0.32310236
#> alpha_5_6             .           .           .           .           .
#> alpha_6_6             0.17909228  0.20372524  0.22665981  0.24795738  0.26770279
#>
#> (Intercept)           .            .           .           .
#> shifted_log_lambda1 -1.824378428 -1.830612693 -1.83645436 -1.8417227929
#> shifted_log_lambda2 -1.495969417 -1.525936446 -1.55590437 -1.5828159876
#> shifted_log_lambda3 -2.362756873 -2.380984221 -2.39919120 -2.4154661275
#> shifted_log_lambda4 -2.207774614 -2.214825772 -2.22147429 -2.2272966480
#> shifted_log_lambda5 -1.923907579 -1.944715961 -1.96404182 -1.9816665946
#> shifted_log_lambda6 -1.692322354 -1.704329623 -1.71586980 -1.7264012314
```

```
#> alpha_1_1             0.706420771  0.714273538  0.72148732  0.7280641804
#> alpha_1_2             .            .            .           .
#> alpha_1_3            -0.104686551 -0.105880371 -0.10691818 -0.1079136795
#> alpha_1_4            -0.472113215 -0.480570637 -0.48842465 -0.4957083508
#> alpha_1_5             .            .            .           .
#> alpha_1_6             .            .            .           .
#> alpha_2_2             0.365231058  0.387075949  0.40820579  0.4273455493
#> alpha_2_3            -0.305114677 -0.305815129 -0.30636283 -0.3069339669
#> alpha_2_4            -0.046947783 -0.048596999 -0.05004025 -0.0514147380
#> alpha_2_5             .            .            .           .
#> alpha_2_6            -0.109143527 -0.115093609 -0.12043323 -0.1253648897
#> alpha_3_3             0.910085926  0.926074309  0.94127780  0.9551291844
#> alpha_3_4             0.032928903  0.034925012  0.03678563  0.0384505374
#> alpha_3_5             .            .            .           .
#> alpha_3_6            -0.002641043 -0.008970064 -0.01465657 -0.0199259149
#> alpha_4_4             0.944973566  0.952415505  0.95922834  0.9654705170
#> alpha_4_5             .            .            .           .
#> alpha_4_6             .            .            .          -0.0001235012
#> alpha_5_5             0.336883059  0.349521876  0.36122406  0.3718893953
#> alpha_5_6             .            .            .           .
#> alpha_6_6             0.286195343  0.303638919  0.31969756  0.3344838648
#>
#> (Intercept)           .            .            .           .
#> shifted_log_lambda1 -1.846604276 -1.851019852 -1.85518987 -1.85881765
#> shifted_log_lambda2 -1.608073073 -1.630891165 -1.65395516 -1.67314120
#> shifted_log_lambda3 -2.432305929 -2.447419360 -2.46263680 -2.47518621
#> shifted_log_lambda4 -2.226802481 -2.226517687 -2.22641442 -2.22612218
#> shifted_log_lambda5 -1.997951870 -2.012788813 -2.02665816 -2.03895010
#> shifted_log_lambda6 -1.735059107 -1.742807381 -1.75051011 -1.75709925
#> alpha_1_1             0.734098510  0.739600323  0.74465999  0.74923506
#> alpha_1_2             .            .            .           .
#> alpha_1_3            -0.108826854 -0.109689326 -0.11041960 -0.11117679
#> alpha_1_4            -0.502370830 -0.508537935 -0.51423243 -0.51949390
#> alpha_1_5             .            .            .           .
#> alpha_1_6             .            .            .           .
#> alpha_2_2             0.445355087  0.461708699  0.47766007  0.49135837
#> alpha_2_3            -0.307390993 -0.307854718 -0.30818634 -0.30861860
#> alpha_2_4            -0.052712435 -0.053932459 -0.05498330 -0.05603740
#> alpha_2_5             .            .            .           .
#> alpha_2_6            -0.130133550 -0.134507176 -0.13843150 -0.14204601
#> alpha_3_3             0.968077228  0.979900242  0.99121255  1.00111082
#> alpha_3_4             0.039990972  0.041375244  0.04267971  0.04380568
#> alpha_3_5             .            .            .           .
#> alpha_3_6            -0.023996316 -0.027805812 -0.03117735 -0.03437332
#> alpha_4_4             0.971102428  0.976262867  0.98098064  0.98529784
#> alpha_4_5             .            .            .           .
#> alpha_4_6            -0.003502447 -0.006505082 -0.00927081 -0.01175979
#> alpha_5_5             0.381721726  0.390675883  0.39901576  0.40643044
#> alpha_5_6             .            .            .           .
#> alpha_6_6             0.348146204  0.360586168  0.37212839  0.38252942
#>
#> (Intercept)           .            .            .           .
#> shifted_log_lambda1 -1.86238814 -1.867616888 -1.872845866 -1.8787357819
```

```
#> shifted_log_lambda2 -1.69394387 -1.711605579 -1.728123636 -1.7446792255
#> shifted_log_lambda3 -2.48889868 -2.500635733 -2.511689181 -2.5228444784
#> shifted_log_lambda4 -2.22612185 -2.226430573 -2.226985575 -2.2277795412
#> shifted_log_lambda5 -2.05081513 -2.061259141 -2.070927086 -2.0773207026
#> shifted_log_lambda6 -1.76392328 -1.770851919 -1.777808352 -1.7820704507
#> alpha_1_1            0.75347894  0.757318626  0.760811746  0.7640470653
#> alpha_1_2            .           .            .            .
#> alpha_1_3           -0.11175414 -0.112325190 -0.112888592 -0.1133825879
#> alpha_1_4           -0.52433484 -0.528850176 -0.533021692 -0.5368835267
#> alpha_1_5            .           .            .            0.0008420666
#> alpha_1_6            .           0.001335293  0.002814751  0.0040745032
#> alpha_2_2            0.50543080  0.517683447  0.529055819  0.5401259533
#> alpha_2_3           -0.30884806 -0.309252620 -0.309518093 -0.3096910324
#> alpha_2_4           -0.05688561 -0.057739536 -0.058497916 -0.0591433633
#> alpha_2_5            .           .            .            .
#> alpha_2_6           -0.14532362 -0.148300249 -0.151074825 -0.1535820483
#> alpha_3_3            1.01096961  1.019651444  1.027655523  1.0353079325
#> alpha_3_4            0.04491434  0.045870576  0.046743827  0.0475653975
#> alpha_3_5            .           .            .            .
#> alpha_3_6           -0.03714688 -0.039546585 -0.041719577 -0.0435612086
#> alpha_4_4            0.98924418  0.992818582  0.996112618  0.9991248705
#> alpha_4_5            .           .            .            .
#> alpha_4_6           -0.01408797 -0.015837963 -0.017345733 -0.0186357642
#> alpha_5_5            0.41353395  0.419811567  0.425609737  0.4309643342
#> alpha_5_6            .           .            .           -0.0018408448
#> alpha_6_6            0.39232929  0.400933832  0.409027705  0.4166265049
#>
#> (Intercept)          .            .            .            .
#> shifted_log_lambda1 -1.885936265 -1.892767725 -1.899569765 -1.905941766
#> shifted_log_lambda2 -1.758682679 -1.772711404 -1.785488449 -1.797051081
#> shifted_log_lambda3 -2.532194063 -2.541600235 -2.550069692 -2.557705439
#> shifted_log_lambda4 -2.228353182 -2.229012596 -2.232083489 -2.235328238
#> shifted_log_lambda5 -2.083256080 -2.089268446 -2.095553697 -2.101478755
#> shifted_log_lambda6 -1.785195655 -1.788477264 -1.791483364 -1.794251286
#> alpha_1_1            0.767009588  0.769750311  0.772255810  0.774542762
#> alpha_1_2            .            .            .            .
#> alpha_1_3           -0.113923852 -0.114371844 -0.114810895 -0.1152237723
#> alpha_1_4           -0.540492888 -0.543800878 -0.546820338 -0.549594895
#> alpha_1_5            0.002922982  0.004860086  0.007079018  0.009198880
#> alpha_1_6            0.005218783  0.006297844  0.007260814  0.008155911
#> alpha_2_2            0.549666292  0.559021269  0.567503178  0.575195346
#> alpha_2_3           -0.309929733 -0.310078334 -0.310232286 -0.310385821
#> alpha_2_4           -0.059788223 -0.060330721 -0.060841231 -0.061316731
#> alpha_2_5            .            .            .            .
#> alpha_2_6           -0.155829574 -0.157934765 -0.159800229 -0.161498603
#> alpha_3_3            1.041968730  1.048402848  1.054215640  1.059490481
#> alpha_3_4            0.048264840  0.048936344  0.049526556  0.050055399
#> alpha_3_5            .            .            .            .
#> alpha_3_6           -0.045239569 -0.046759744 -0.048114091 -0.049354936
#> alpha_4_4            1.001855415  1.004360075  1.006527696  1.008476129
#> alpha_4_5            .            .            0.001880328  0.003790177
#> alpha_4_6           -0.019764611 -0.020814965 -0.021821380 -0.022677175
#> alpha_5_5            0.435755777  0.440408465  0.444281710  0.447815414
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#> alpha_5_6           -0.003948522 -0.005849693 -0.007573185 -0.009143491
#> alpha_6_6            0.423439448  0.429890623  0.435720678  0.441024825
#>
#> (Intercept)          .            .            .            .
#> shifted_log_lambda1 -1.911745495 -1.917023410 -1.921820113 -1.926919075
#> shifted_log_lambda2 -1.807483670 -1.816855825 -1.825219587 -1.834430916
#> shifted_log_lambda3 -2.564604886 -2.570831251 -2.576427071 -2.582751764
#> shifted_log_lambda4 -2.238275715 -2.240948527 -2.243370525 -2.245983272
#> shifted_log_lambda5 -2.106912316 -2.111859643 -2.116347579 -2.121197017
#> shifted_log_lambda6 -1.796806035 -1.799171588 -1.801377525 -1.804586315
#> alpha_1_1            0.776625533  0.778521249  0.780245297  0.781913873
#> alpha_1_2            .            .            .            .
#> alpha_1_3           -0.115606879 -0.115962349 -0.116292738 -0.116506599
#> alpha_1_4           -0.552139564 -0.554471853 -0.556608607 -0.558546512
#> alpha_1_5            0.011131911  0.012890703  0.014489169  0.016064162
#> alpha_1_6            0.008973830  0.009721682  0.010407233  0.011158276
#> alpha_2_2            0.582160128  0.588445725  0.594090567  0.600080306
#> alpha_2_3           -0.310538365 -0.310691181 -0.310846796 -0.310966761
#> alpha_2_4           -0.061759243 -0.062171817 -0.062557846 -0.062844403
#> alpha_2_5            .            .            .            .
#> alpha_2_6           -0.163048720 -0.164461856 -0.165747785 -0.166958786
#> alpha_3_3            1.064279699  1.068620466  1.072541658  1.076581438
#> alpha_3_4            0.050533071  0.050964758  0.051354514  0.051752064
#> alpha_3_5            .            .            .            .
#> alpha_3_6           -0.050486418 -0.051512793 -0.052439173 -0.053174177
#> alpha_4_4            1.010253431  1.011875662  1.013356399  1.014718795
#> alpha_4_5            0.005533964  0.007123607  0.008572216  0.009966875
#> alpha_4_6           -0.023455194 -0.024162290 -0.024803478 -0.025367772
#> alpha_5_5            0.451032864  0.453947674  0.456576214  0.459252303
#> alpha_5_6           -0.010556773 -0.011830151 -0.012973133 -0.013951988
#> alpha_6_6            0.445860934  0.450270301  0.454289454  0.458427694
#>
#> (Intercept)          .
#> shifted_log_lambda1 -1.929120443
#> shifted_log_lambda2 -1.839173441
#> shifted_log_lambda3 -2.586296269
#> shifted_log_lambda4 -2.247536254
#> shifted_log_lambda5 -2.124189995
#> shifted_log_lambda6 -1.806431580
#> alpha_1_1            0.783225895
#> alpha_1_2           -0.000340953
#> alpha_1_3           -0.116948070
#> alpha_1_4           -0.560425485
#> alpha_1_5            0.017151731
#> alpha_1_6            0.011622290
#> alpha_2_2            0.603679361
#> alpha_2_3           -0.311224865
#> alpha_2_4           -0.063374025
#> alpha_2_5            .
#> alpha_2_6           -0.167808324
#> alpha_3_3            1.079311454
#> alpha_3_4            0.052032502
#> alpha_3_5            .
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#> alpha_3_6          -0.053830404
#> alpha_4_4           1.015970724
#> alpha_4_5           0.011096244
#> alpha_4_6          -0.025865592
#> alpha_5_5           0.460942997
#> alpha_5_6          -0.014691249
#> alpha_6_6           0.461365850
```