Visualizing Results Notebook

Foil Study − Visualizing Results

gPC studies

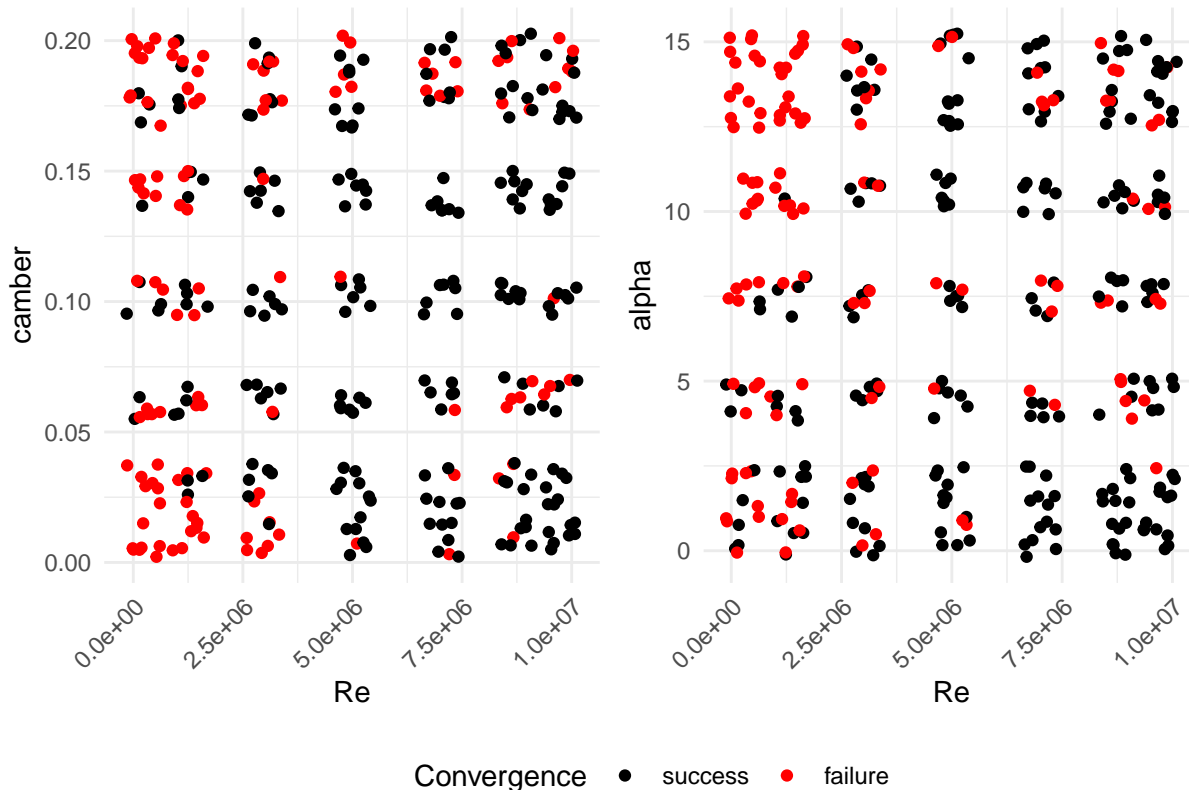#### gPC with non-log transformed Re

Loading results for gPC noLog Re:

```r
column_names <- c("Re", "alpha", "camber")
params_gpc_nolog <- read.csv("./data/parameters/gPC_Params_noLogRe.csv",
                             header = FALSE)
colnames(params_gpc_nolog) <- column_names

gpc_nolog_results <- read.csv("./results/gPC_noLogRe_results.csv")
gpc_nolog_results <- gpc_nolog_results[order(gpc_nolog_results$sim),]
gpc_nolog_results$CLCD <- gpc_nolog_results$CL/gpc_nolog_results$CD
complete_gpc_nolog <- cbind(params_gpc_nolog, gpc_nolog_results)
```
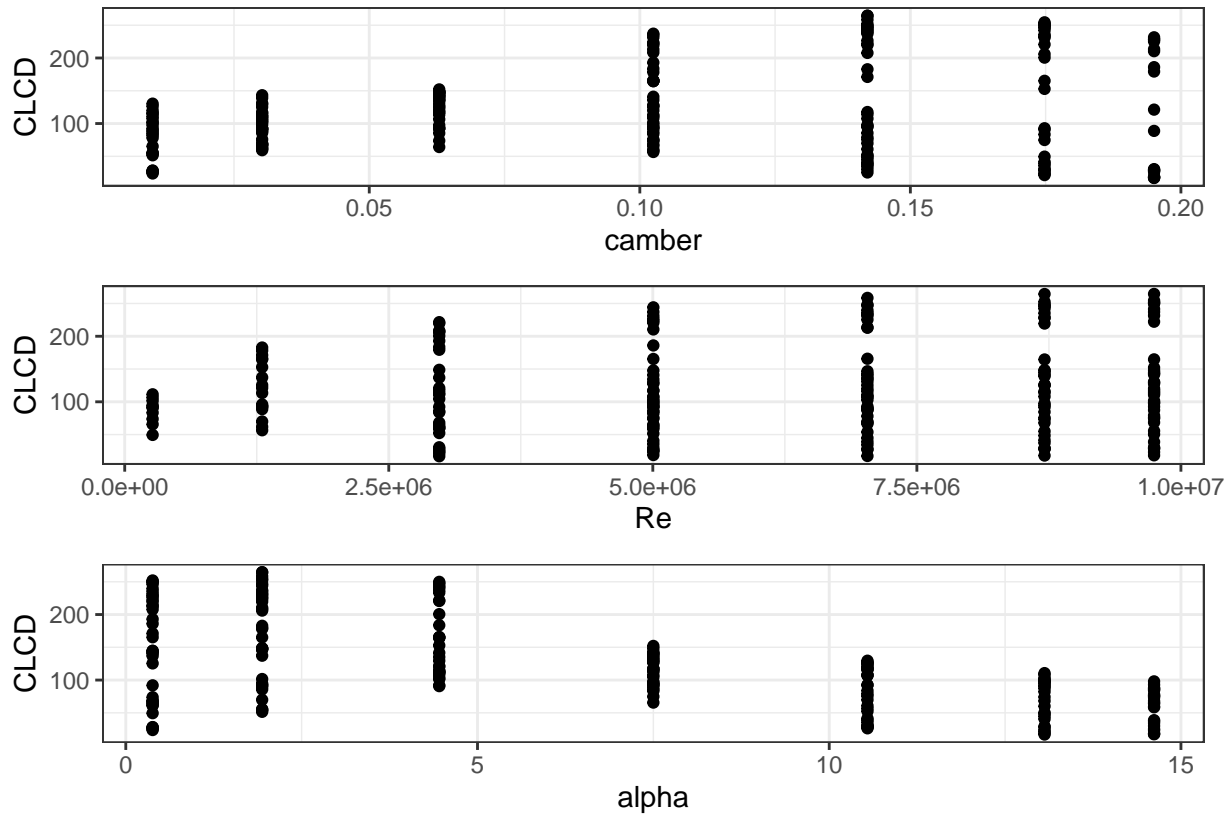
Convergence rate: 64%.

Plotting parameters for GPC (Re no log) showing where simulations did not converge:
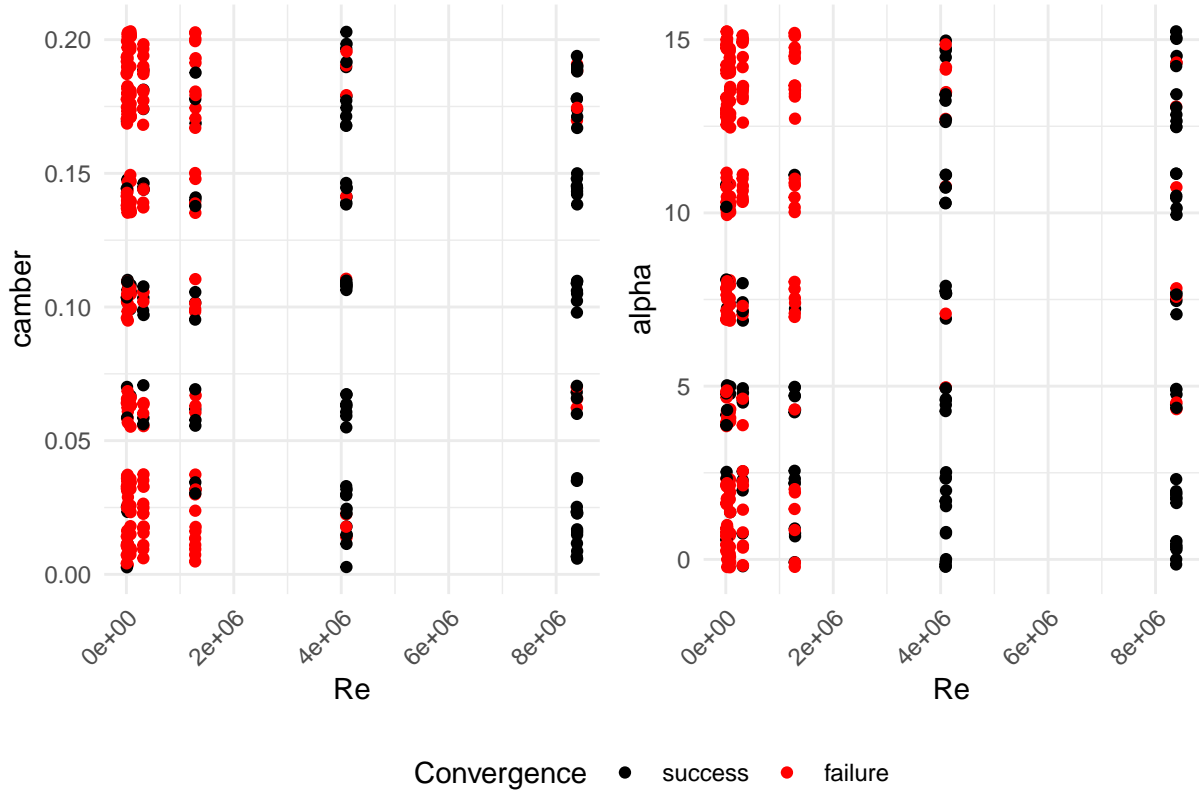

CL/CD results:

gPC with log-transformed Re range

Loading results for log-transformed Re study:
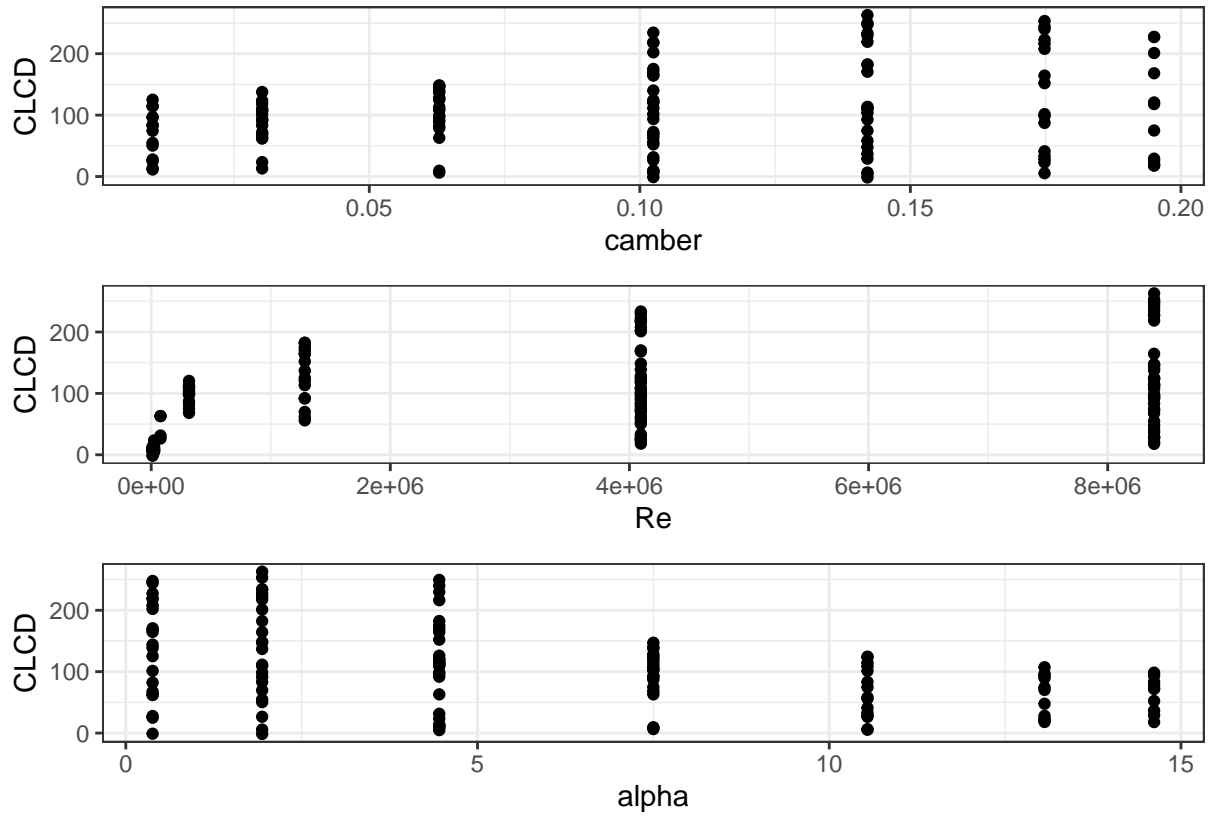
```r
params_gpc_log <- read.csv("./data/parameters/gPC_Params_LogRe.csv",
                           header = FALSE)
colnames(params_gpc_log) <- column_names
gpc_log_results <- read.csv("./results/gPC_LogRe_results.csv")
gpc_log_results <- gpc_log_results[order(gpc_log_results$sim),]
gpc_log_results$CLCD <- gpc_log_results$CL/gpc_log_results$CD
complete_gpc_log <- cbind(params_gpc_log, gpc_log_results)
```

Convergence rate: 38%.

Plotting parameters for GPC (Re log) showing where simulations did not converge:

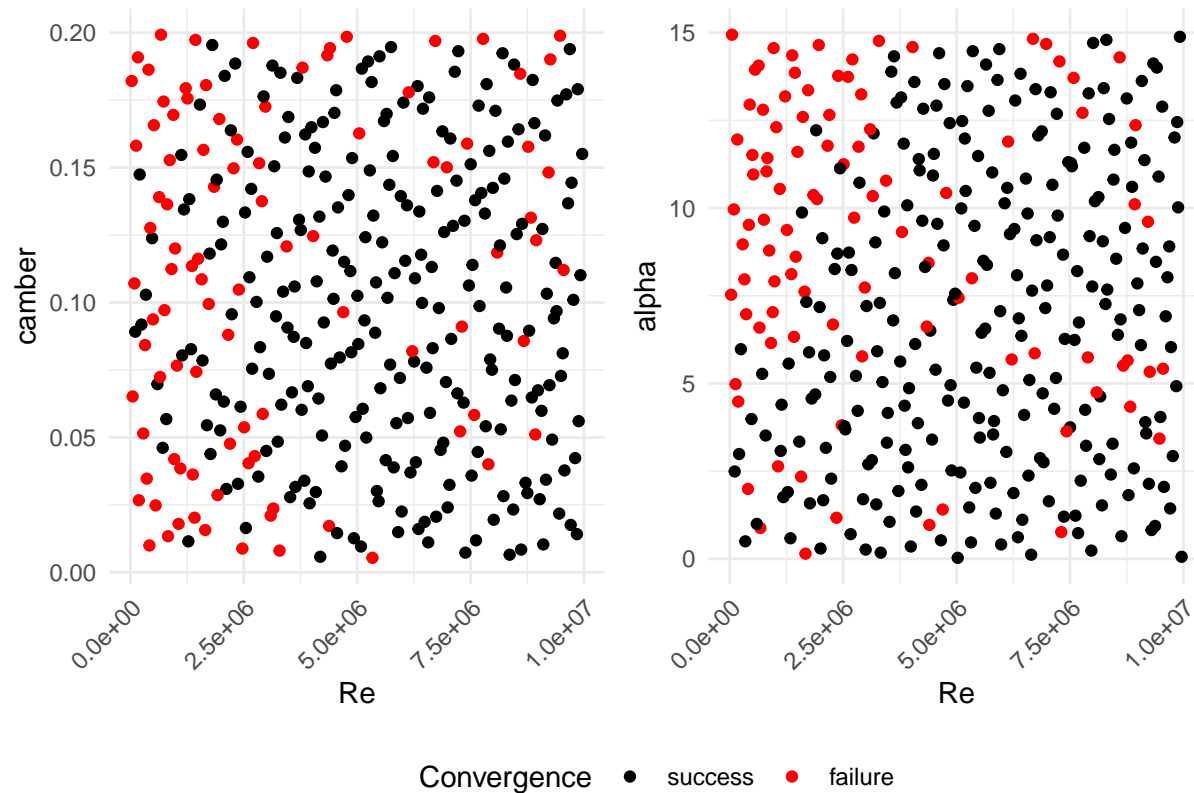Convergence ● success ● failure

CL/CD results:

NN studies

NN with non-log transformed Re

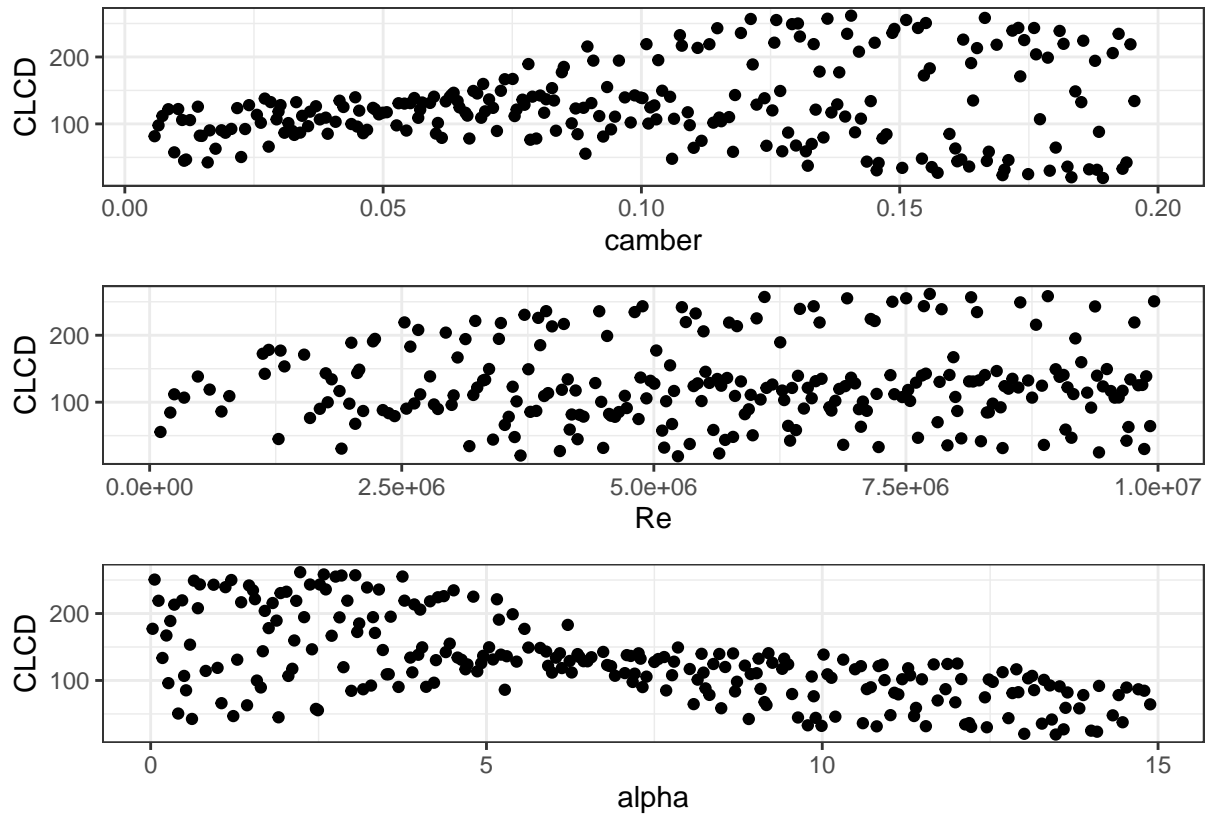Loading data for NN study with non-log-transformed Re:

```
params_nn_nolog <- read.csv("./data/parameters/NN_Params_noLogRe.csv",
                            header = FALSE)
colnames(params_nn_nolog) <- column_names
nn_nolog_results <- read.csv("./results/NN_noLogRe_results.csv")
nn_nolog_results <- nn_nolog_results[order(nn_nolog_results$sim),]
complete_nn_nolog <- cbind(params_nn_nolog, nn_nolog_results)
complete_nn_nolog$CLCD <- complete_nn_nolog$CL/complete_nn_nolog$CD
```

Convergence rate: 72%.

Plotting parameters for NN (Re no log) showing where simulations did not converge:
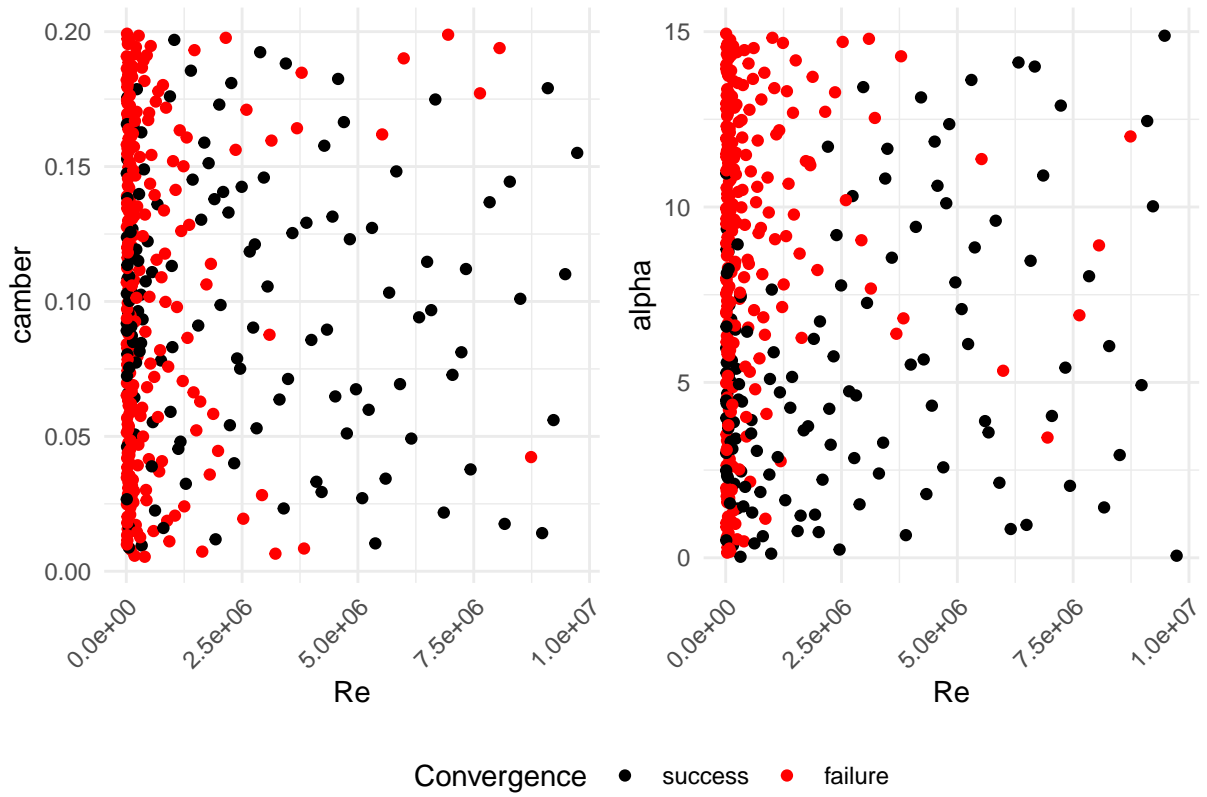

CL/CD results:

NN with log-transformed Re range

Loading data for NN study with log-transformed Re:

```
params_nn_log <- read.csv("./data/parameters/NN_Params_LogRe.csv",
                          header = FALSE)
colnames(params_nn_log) <- column_names
nn_log_results <- read.csv("./results/NN_LogRe_results.csv")
nn_log_results <- nn_log_results[order(nn_log_results$sim),]
complete_nn_log <- cbind(params_nn_log, nn_log_results)
complete_nn_log$CLCD <- complete_nn_log$CL/complete_nn_log$CD
```

Convergence rate: 38%.

Plotting parameters for NN (Re no log) showing where simulations did not converge:

Convergence ● success ● failure

CL/CD results: