

# Online Appendix: Probabilistic Selection Approaches in Decomposition-based Evolutionary Algorithms for Offline Data-Driven Multiobjective Optimization

Atanu Mazumdar, Tinkle Chugh, Jussi Hakanen, Kaisa Miettinen

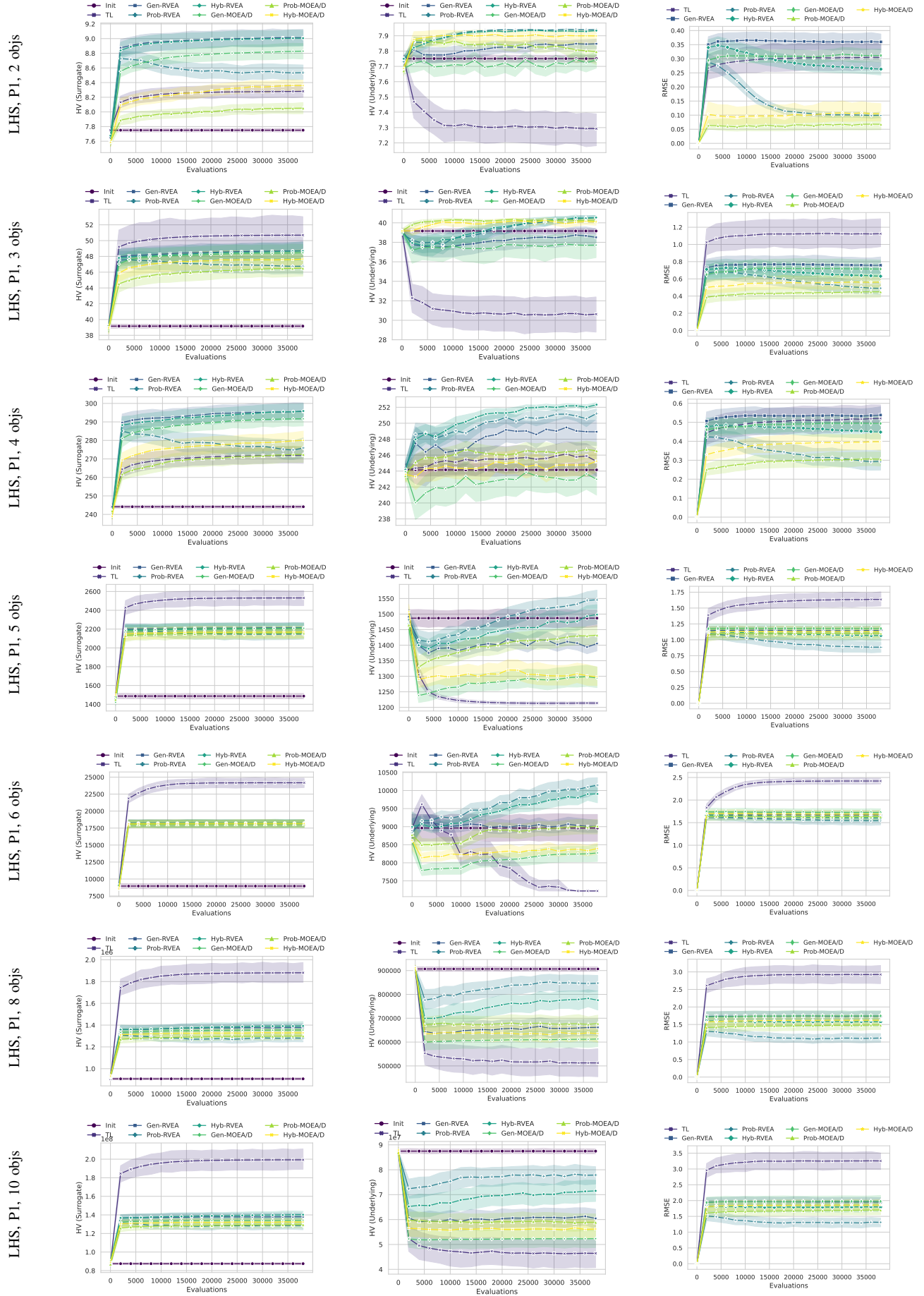


Fig. 1: Progress of the solution process for P1 with LHS showing variation of hypervolume in surrogate objective space, underlying objective space and RMSE with function evaluations for the runs with median hypervolume values.

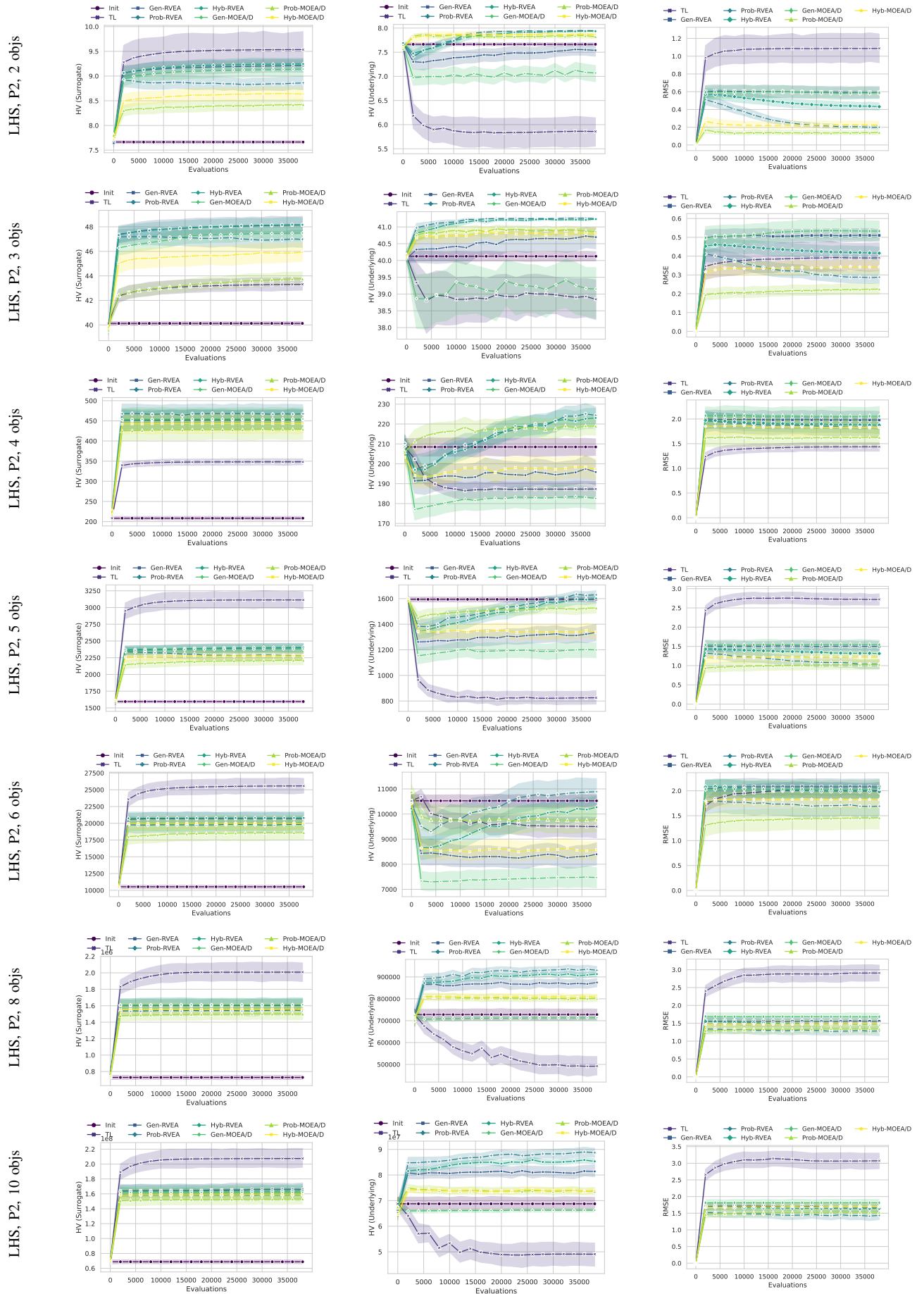
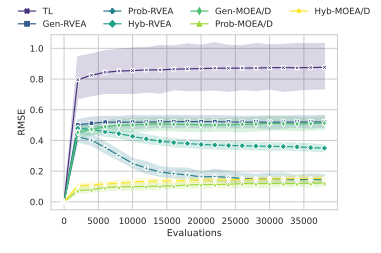
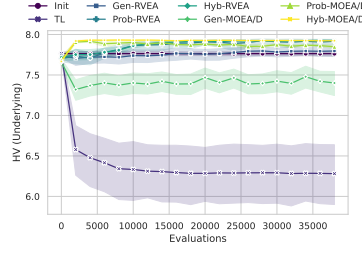
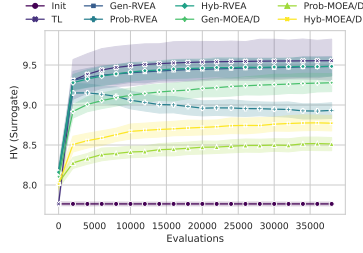
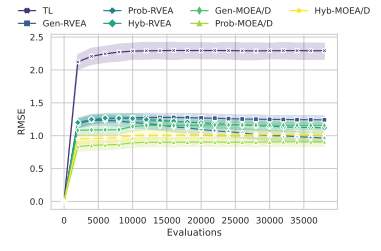
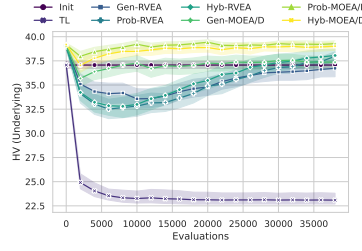
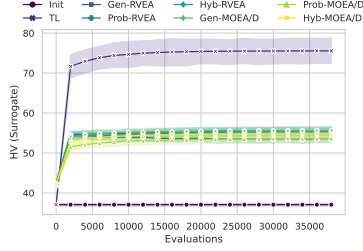


Fig. 2: Progress of the solution process for P2 with LHS showing variation of hypervolume in surrogate objective space, underlying objective space and RMSE with function evaluations for the runs with median hypervolume values.

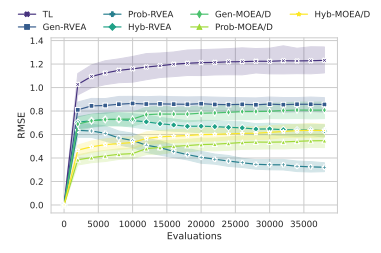
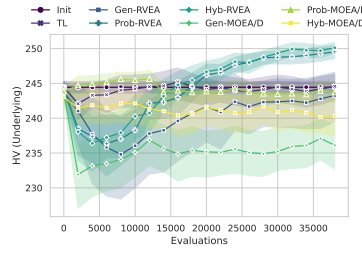
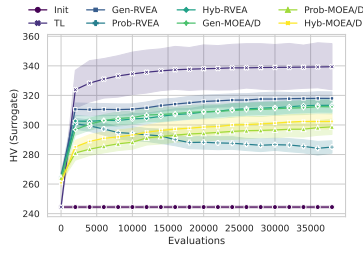
MVNS, P1, 2 objs



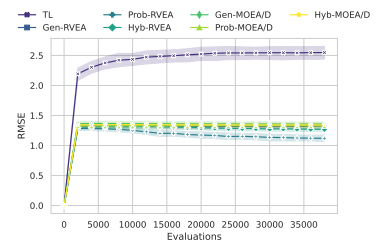
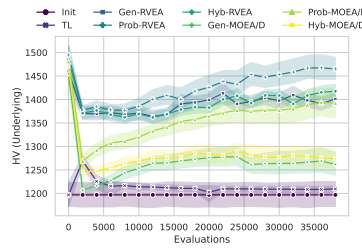
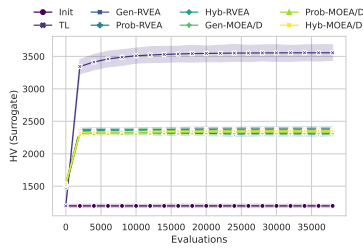
MVNS, P1, 3 objs



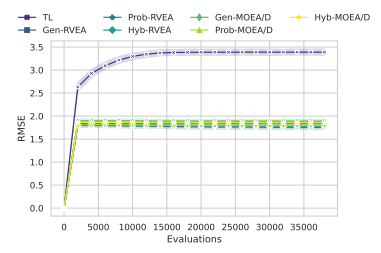
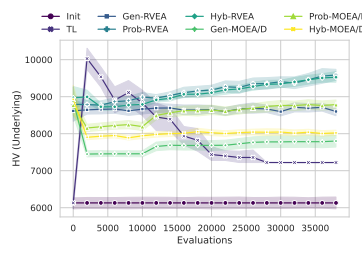
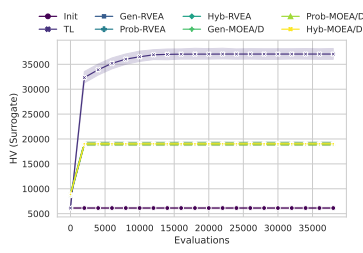
MVNS, P1, 4 objs



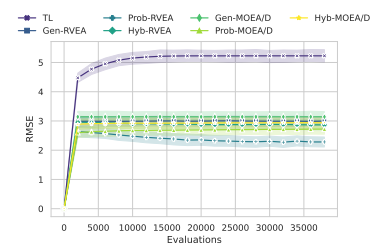
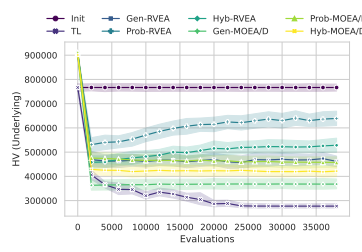
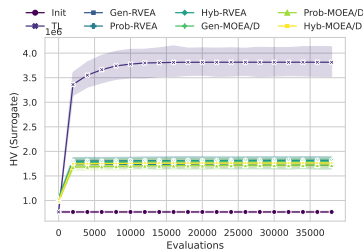
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MVNS, P1, 6 objs



MVNS, P1, 8 objs



MVNS, P1, 10 objs

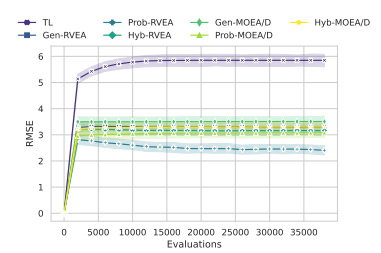
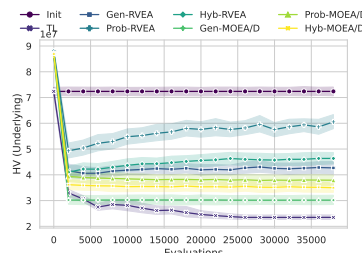
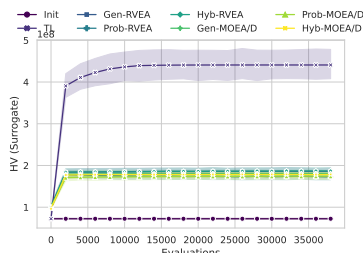
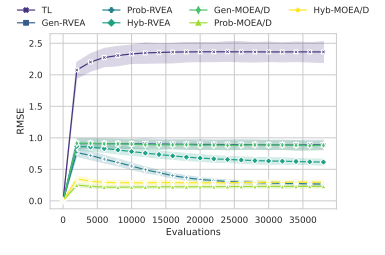
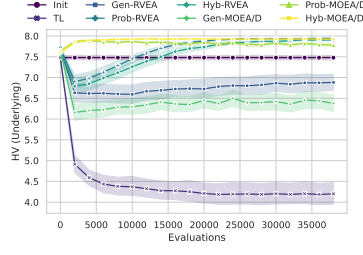
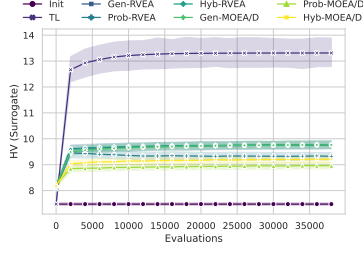
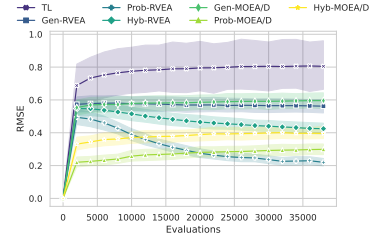
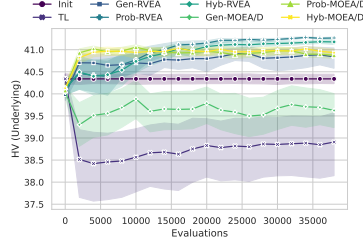
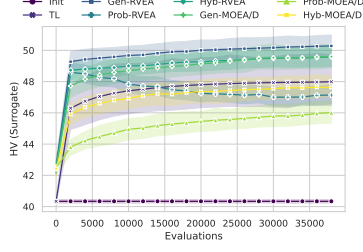


Fig. 3: Progress of the solution process for P1 with MVNS showing variation of hypervolume in surrogate objective space, underlying objective space and RMSE with function evaluations for the runs with median hypervolume values.

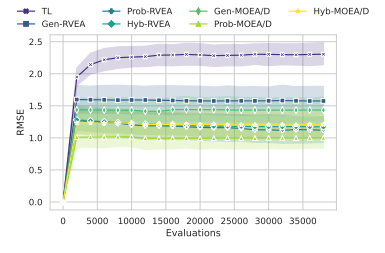
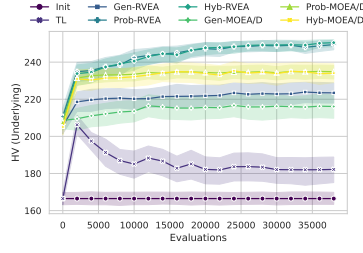
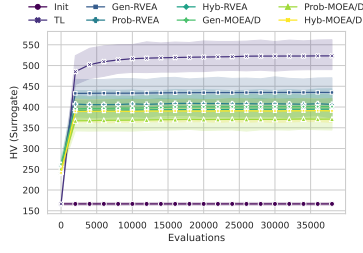
MVNS, P2, 2 objs



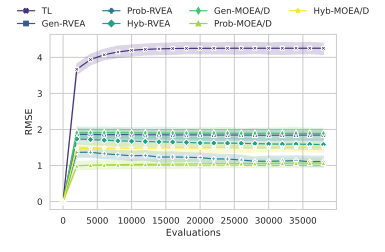
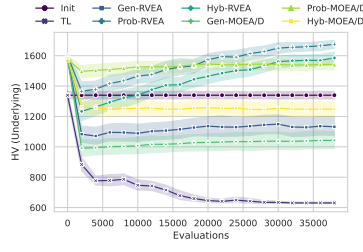
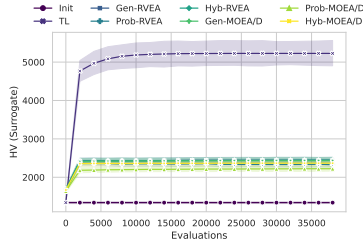
MVNS, P2, 3 objs



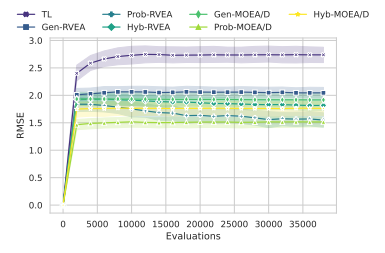
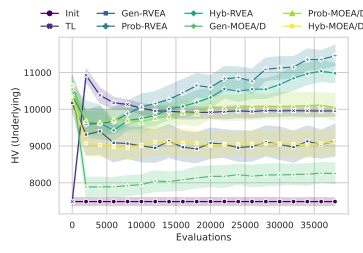
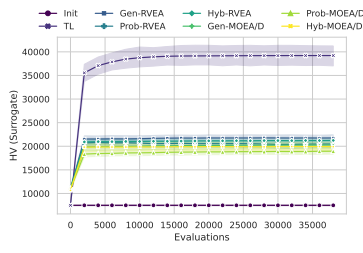
MVNS, P2, 4 objs



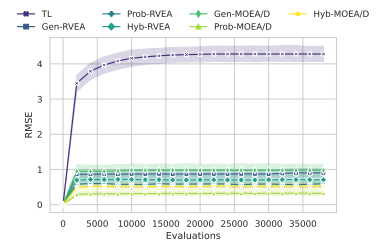
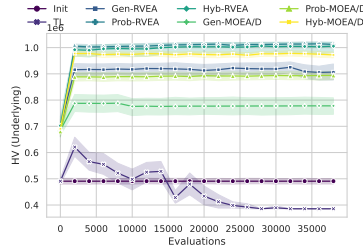
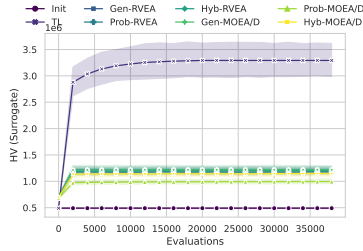
MVNS, P2, 5 objs



MVNS, P2, 6 objs



MVNS, P2, 8 objs



MVNS, P2, 10 objs

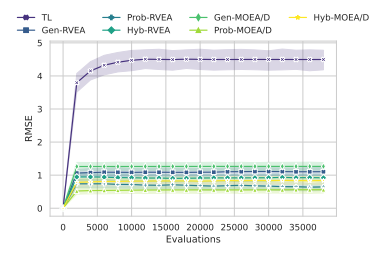
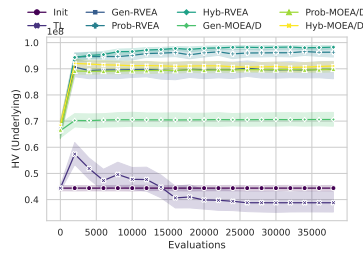
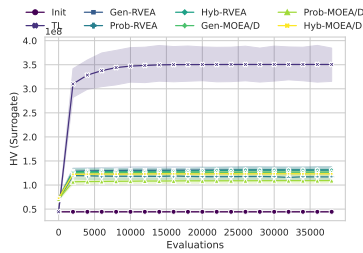
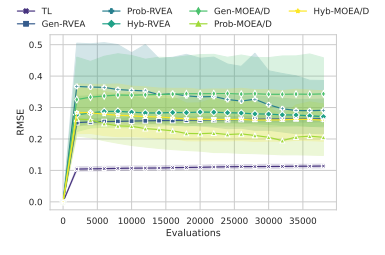
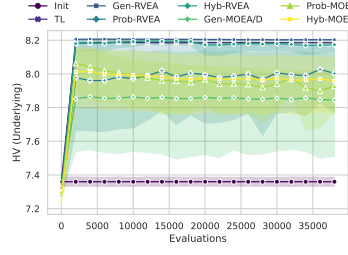
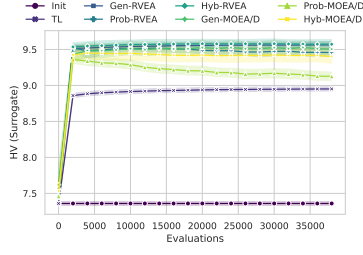


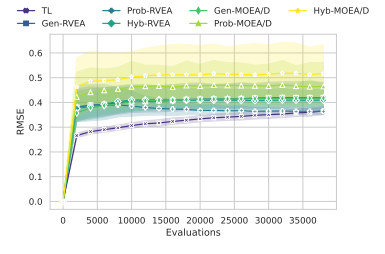
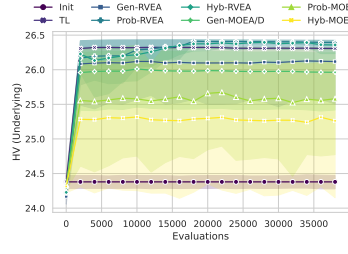
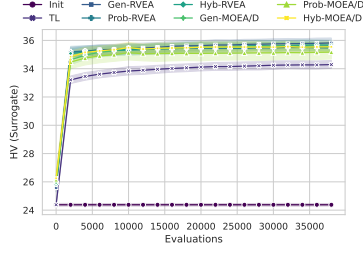
Fig. 4: Progress of the solution process for P2 with MVNS showing variation of hypervolume in surrogate objective space, underlying objective space and RMSE with function evaluations for the runs with median hypervolume values.



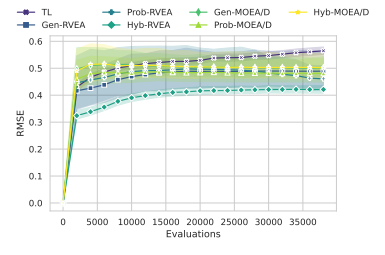
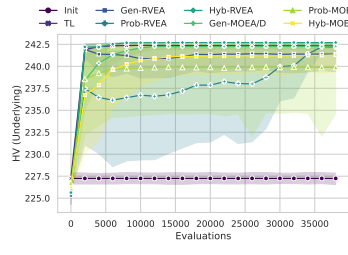
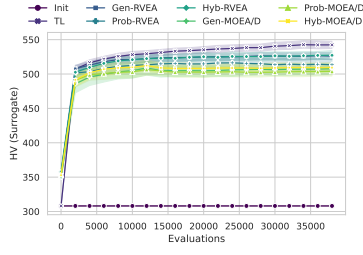
LHS, DTLZ2, 2 objs



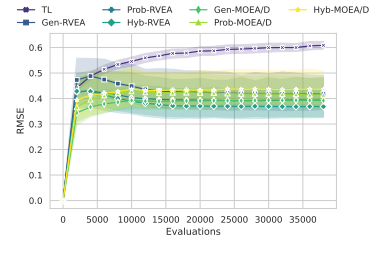
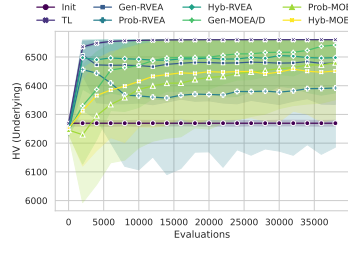
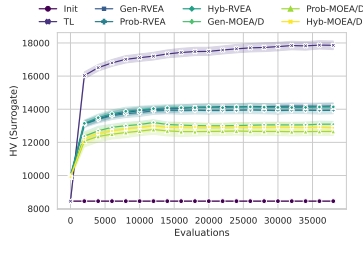
LHS, DTLZ2, 3 objs



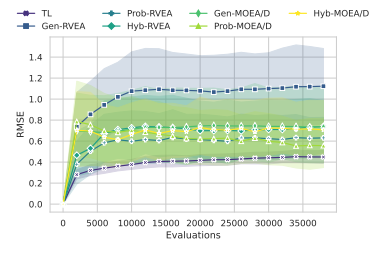
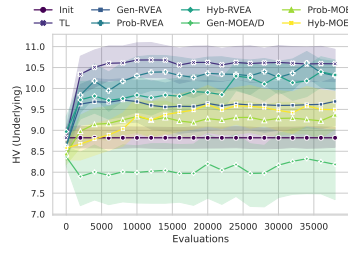
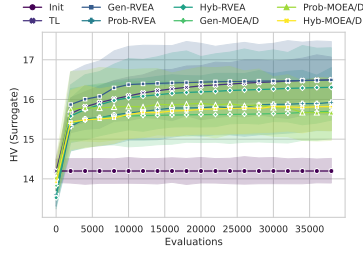
LHS, DTLZ2, 5 objs



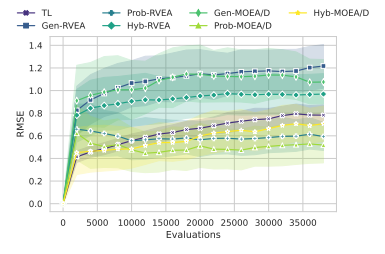
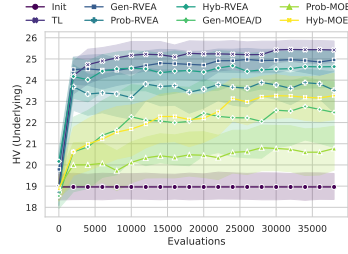
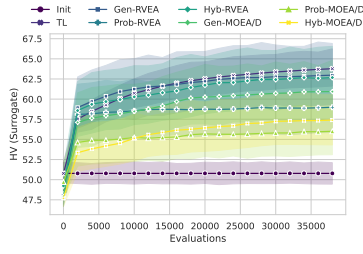
LHS, DTLZ2, 8 objs



LHS, DTLZ4, 2 objs



LHS, DTLZ4, 3 objs



LHS, DTLZ4, 5 objs

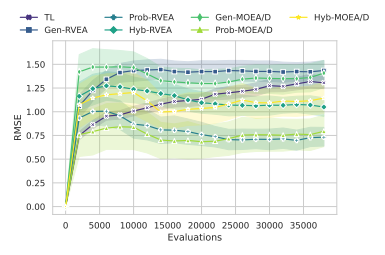
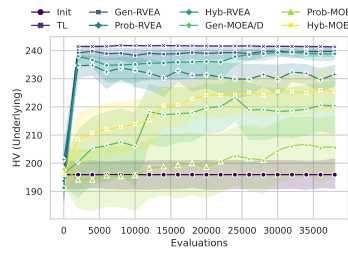
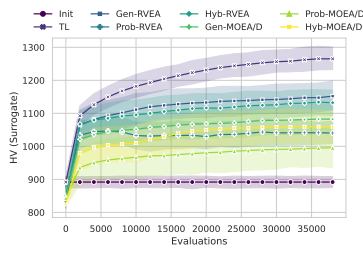
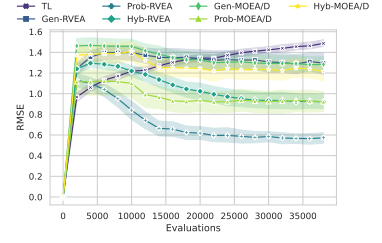
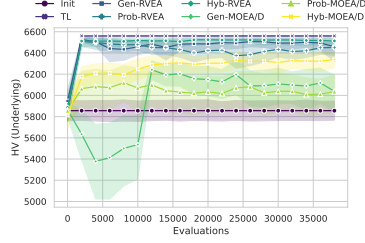
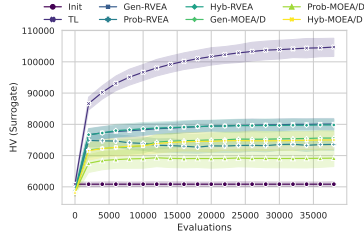
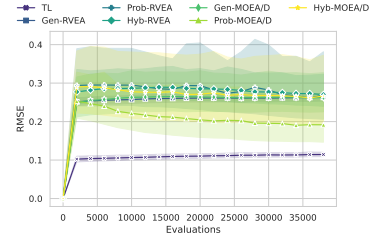
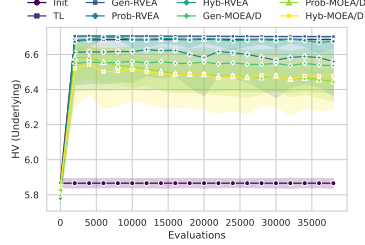
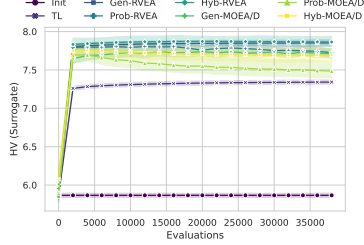


Fig. 5: Progress of the solution process for the instances mentioned showing variation of hypervolume in surrogate objective space, underlying objective space and RMSE with function evaluations for the runs with median hypervolume values.

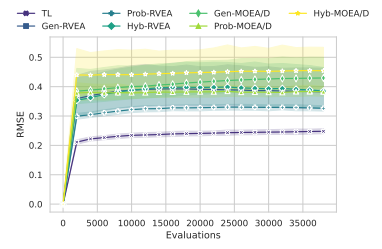
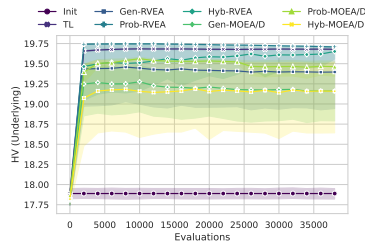
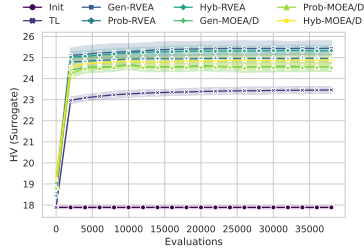
LHS, DTLZ4, 8 objs



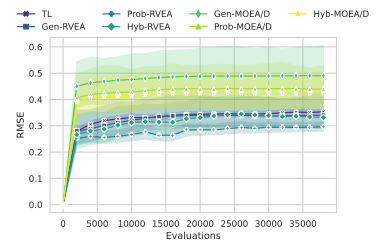
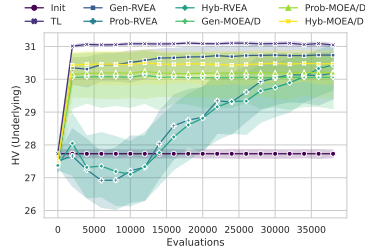
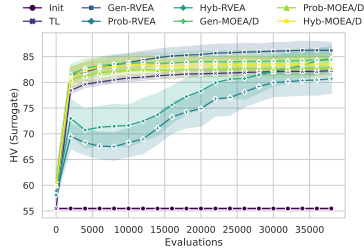
LHS, DTLZ5, 2 objs



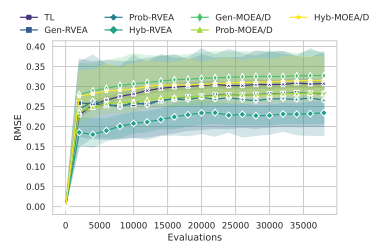
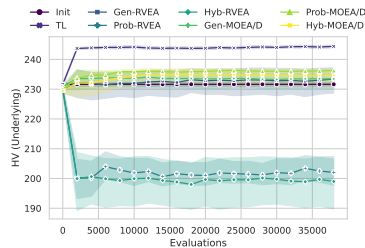
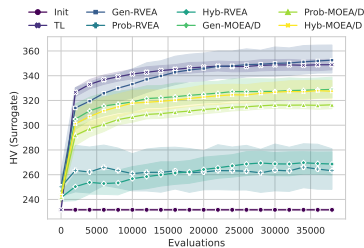
LHS, DTLZ5, 3 objs



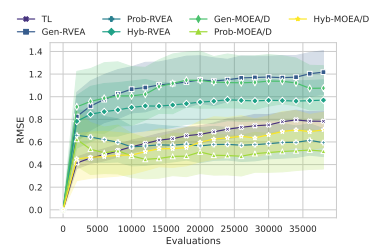
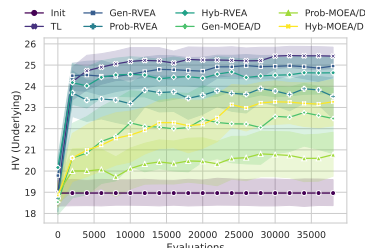
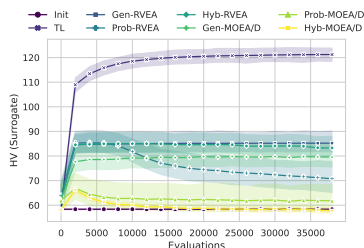
LHS, DTLZ5, 5 objs



LHS, DTLZ5, 8 objs



LHS, DTLZ6, 2 objs



LHS, DTLZ6, 3 objs

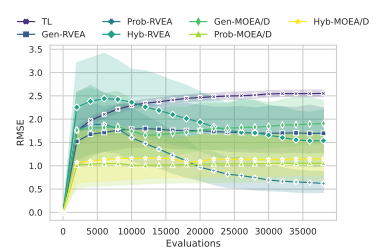
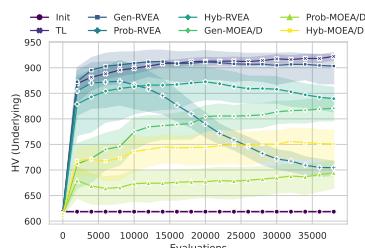
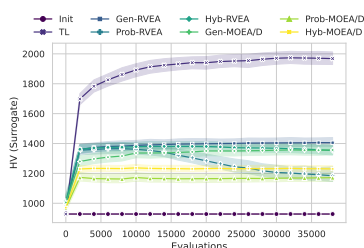
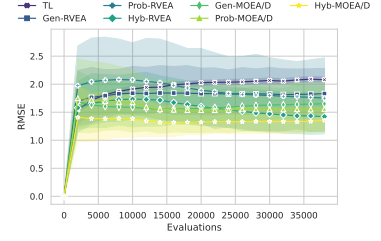
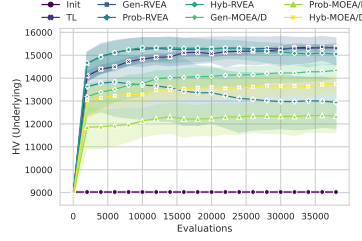
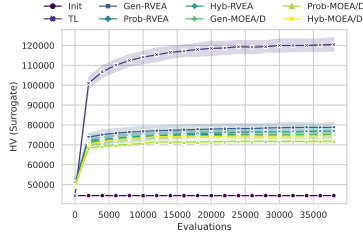
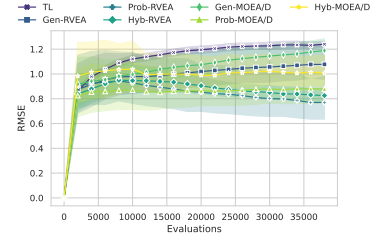
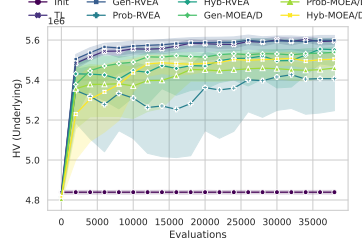
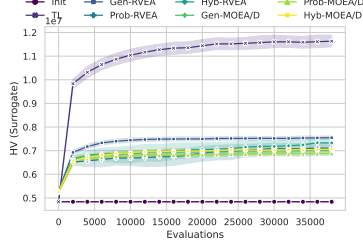


Fig. 6: Progress of the solution process for the instances mentioned showing variation of hypervolume in surrogate objective space, underlying objective space and RMSE with function evaluations for the runs with median hypervolume values.

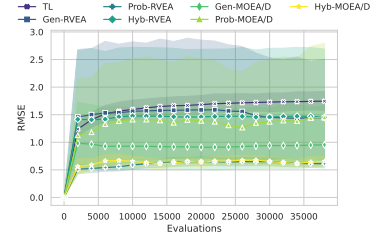
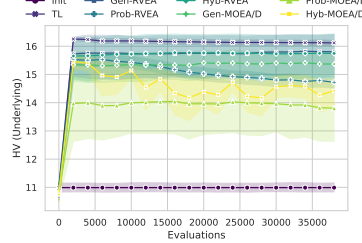
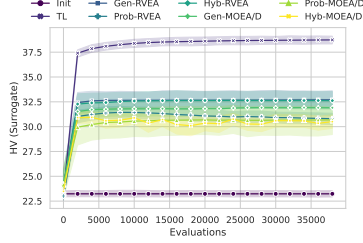
LHS, DTLZ6, 5 objs



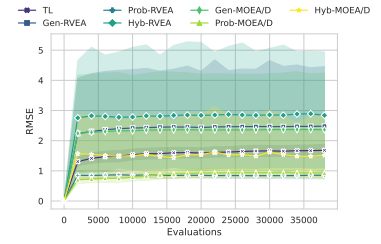
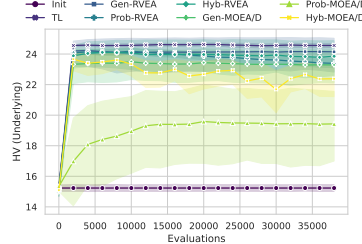
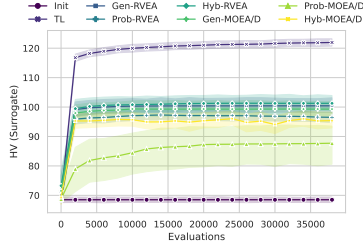
LHS, DTLZ6, 8 objs



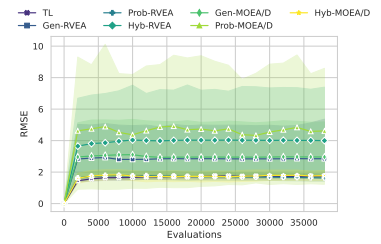
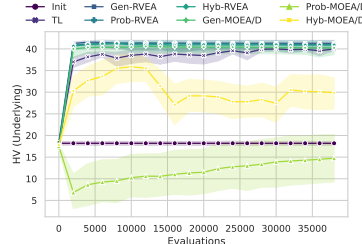
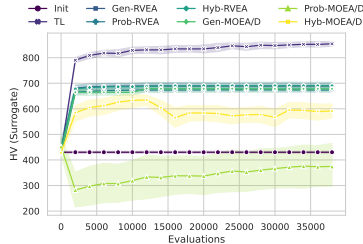
LHS, DTLZ7, 2 objs



LHS, DTLZ7, 3 objs



LHS, DTLZ7, 5 objs



LHS, DTLZ7, 8 objs

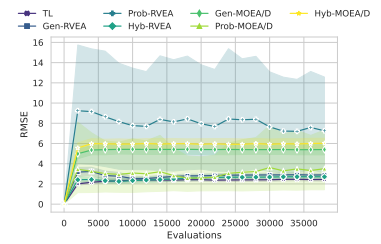
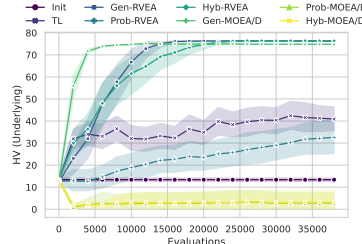
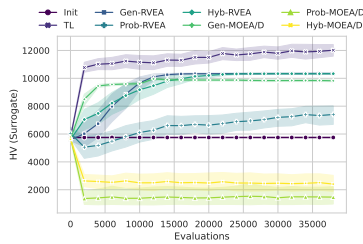
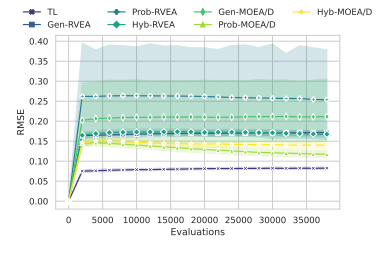
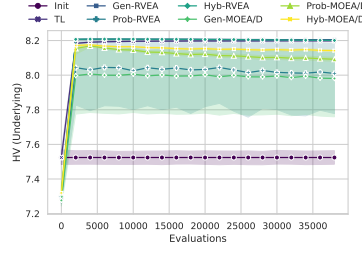
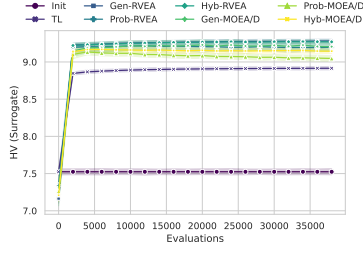


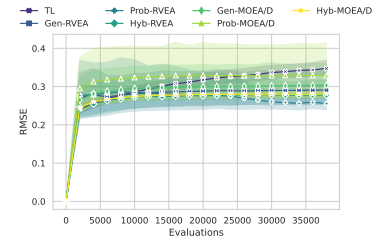
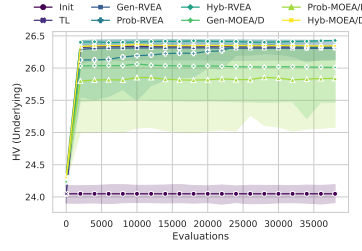
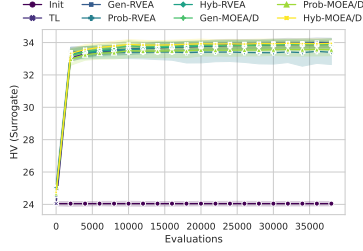
Fig. 7: Progress of the solution process for the instances mentioned showing variation of hypervolume in surrogate objective space, underlying objective space and RMSE with function evaluations for the runs with median hypervolume values.



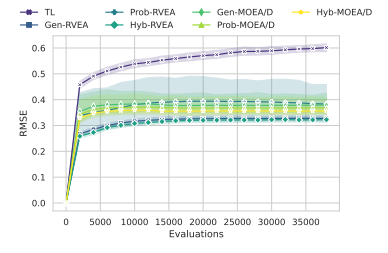
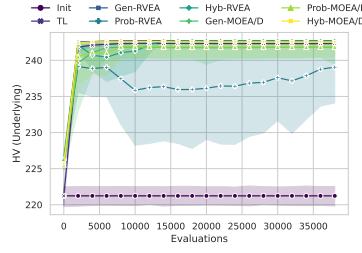
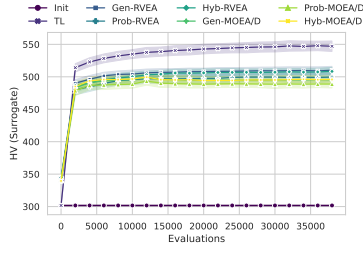
MVNS, DTLZ2, 2 objs



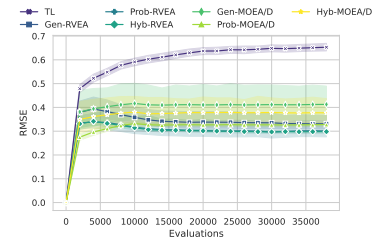
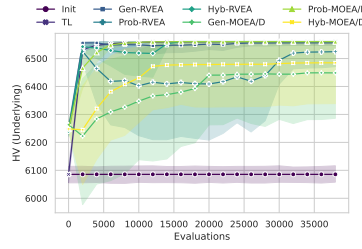
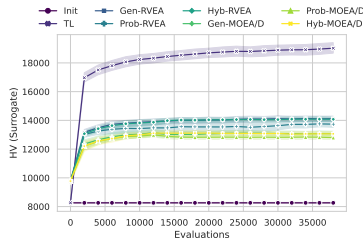
MVNS, DTLZ2, 3 objs



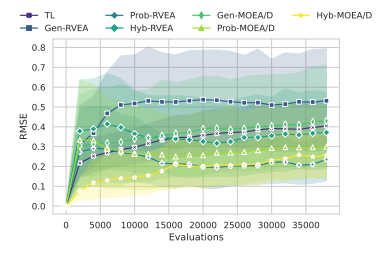
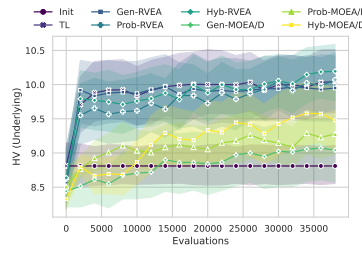
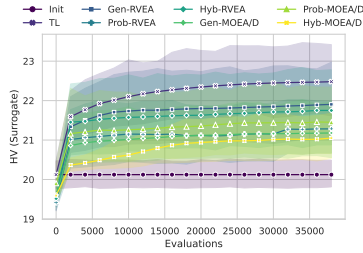
MVNS, DTLZ2, 5 objs



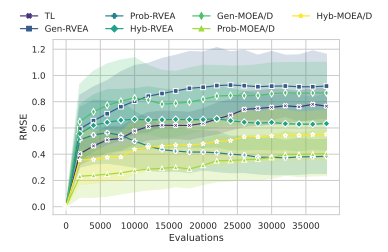
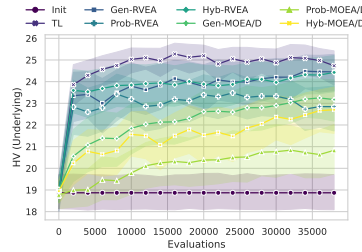
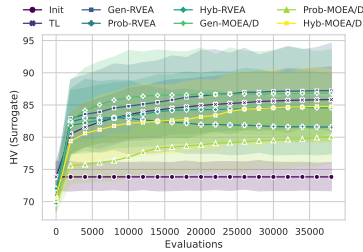
MVNS, DTLZ2, 8 objs



MVNS, DTLZ4, 2 objs



MVNS, DTLZ4, 3 objs



MVNS, DTLZ4, 5 objs

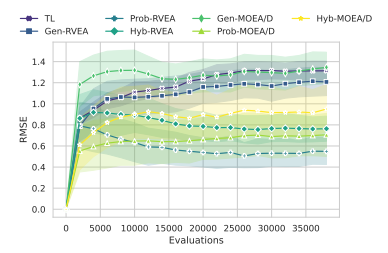
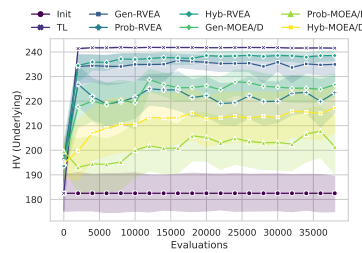
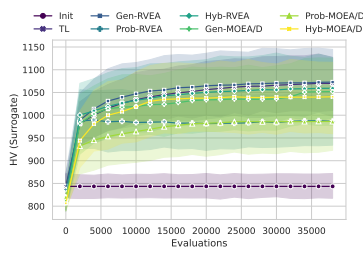
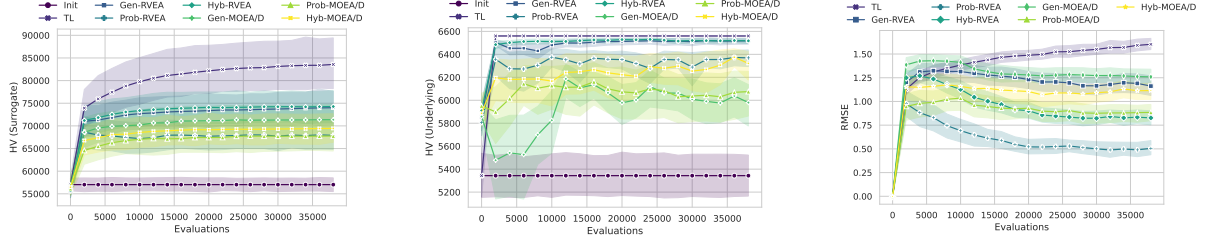
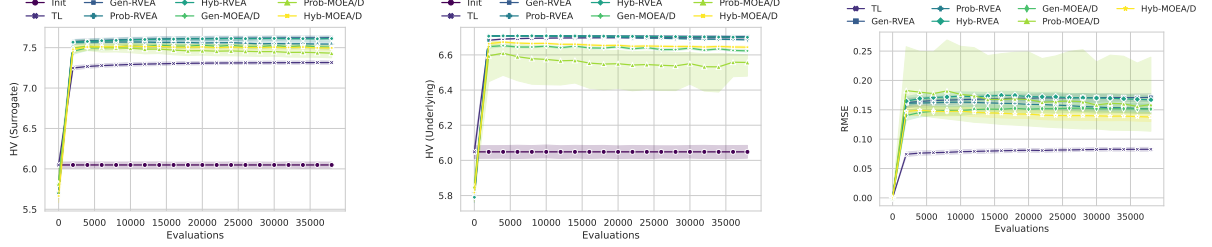


Fig. 8: Progress of the solution process for the instances mentioned showing variation of hypervolume in surrogate objective space, underlying objective space and RMSE with function evaluations for the runs with median hypervolume values.

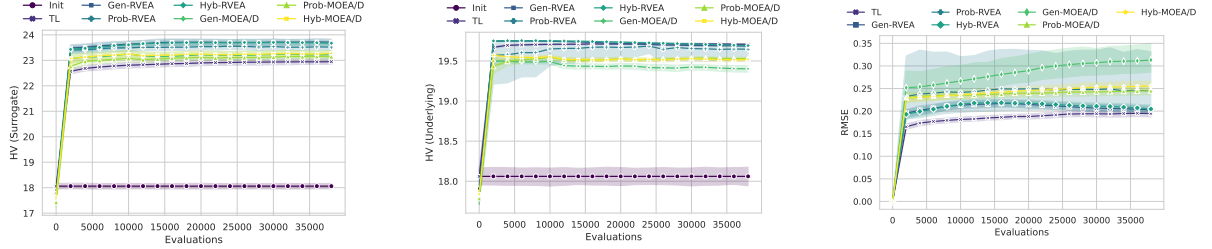
MVNS, DTLZ4, 8 objs



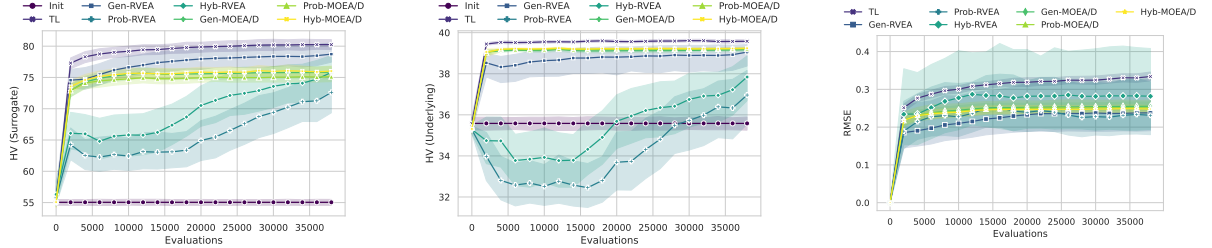
MVNS, DTLZ5, 2 objs



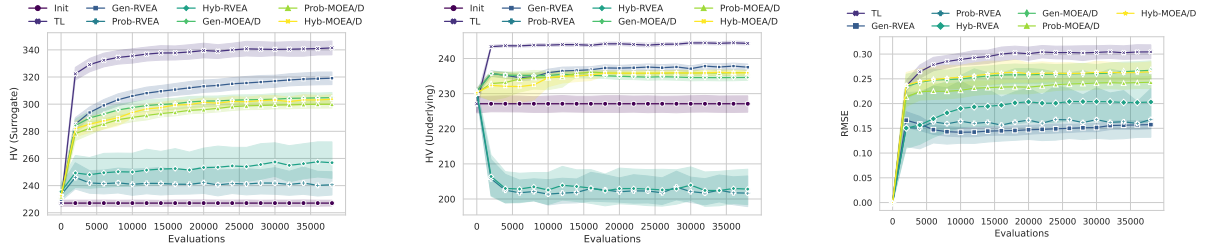
MVNS, DTLZ5, 3 objs



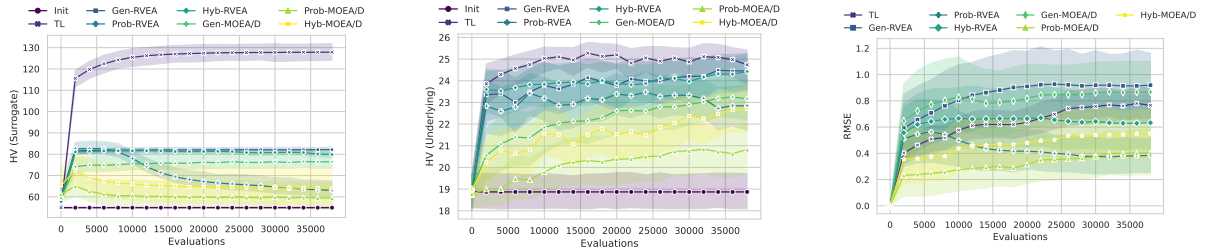
MVNS, DTLZ5, 5 objs



MVNS, DTLZ5, 8 objs



MVNS, DTLZ6, 2 objs



MVNS, DTLZ6, 3 objs

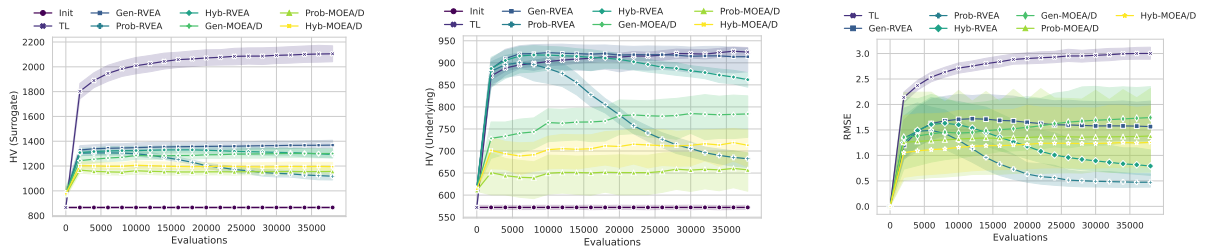
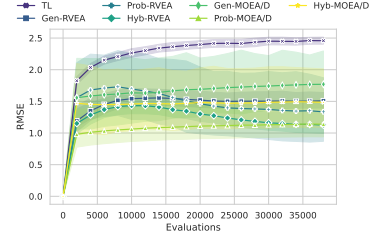
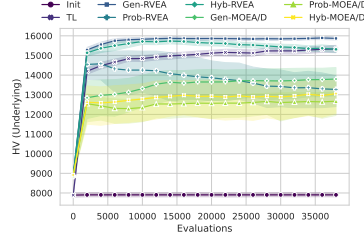
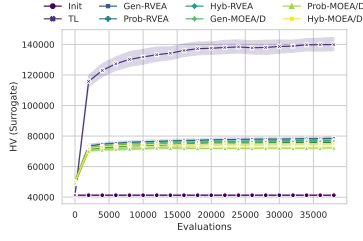
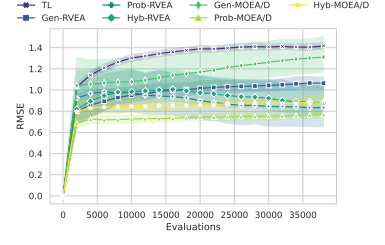
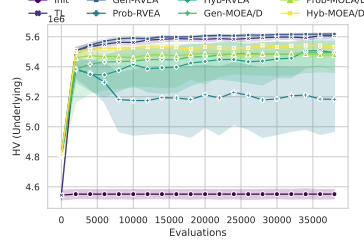
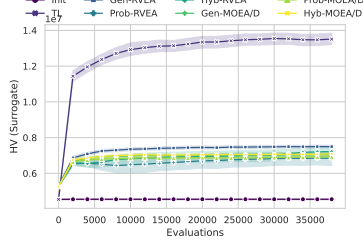


Fig. 9: Progress of the solution process for the instances mentioned showing variation of hypervolume in surrogate objective space, underlying objective space and RMSE with function evaluations for the runs with median hypervolume values.

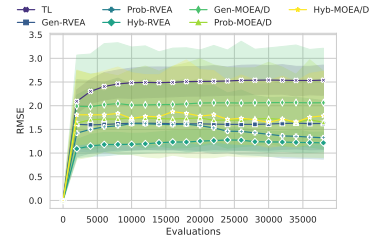
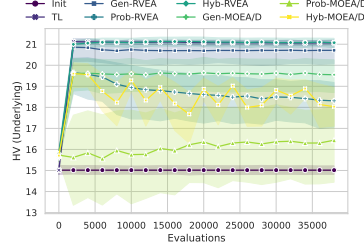
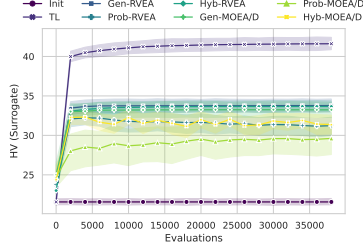
MVNS, DTLZ6, 5 objs



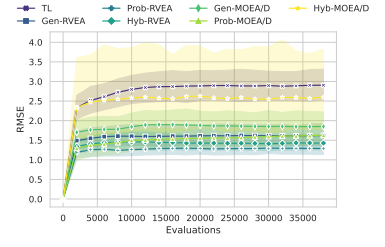
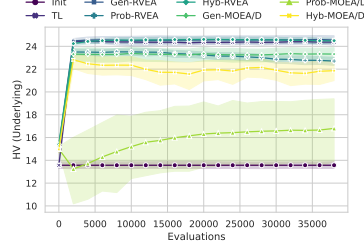
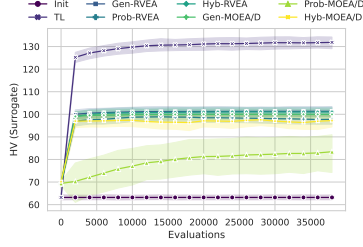
MVNS, DTLZ6, 8 objs



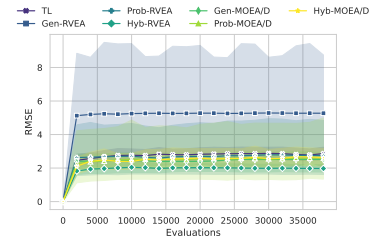
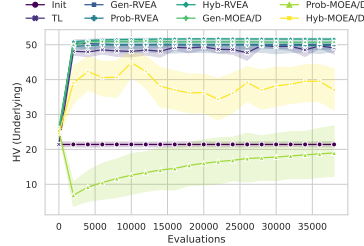
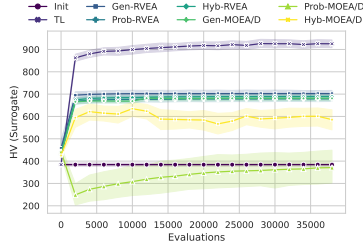
MVNS, DTLZ7, 2 objs



MVNS, DTLZ7, 3 objs



MVNS, DTLZ7, 5 objs



MVNS, DTLZ7, 8 objs

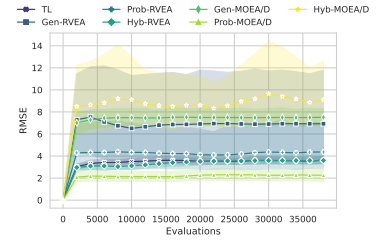
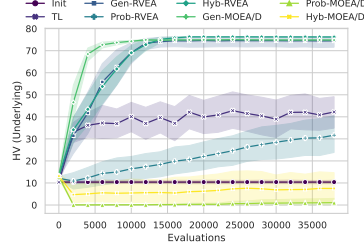
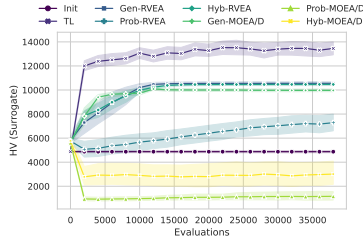


Fig. 10: Progress of the solution process for the instances mentioned showing variation of hypervolume in surrogate objective space, underlying objective space and RMSE with function evaluations for the runs with median hypervolume values.