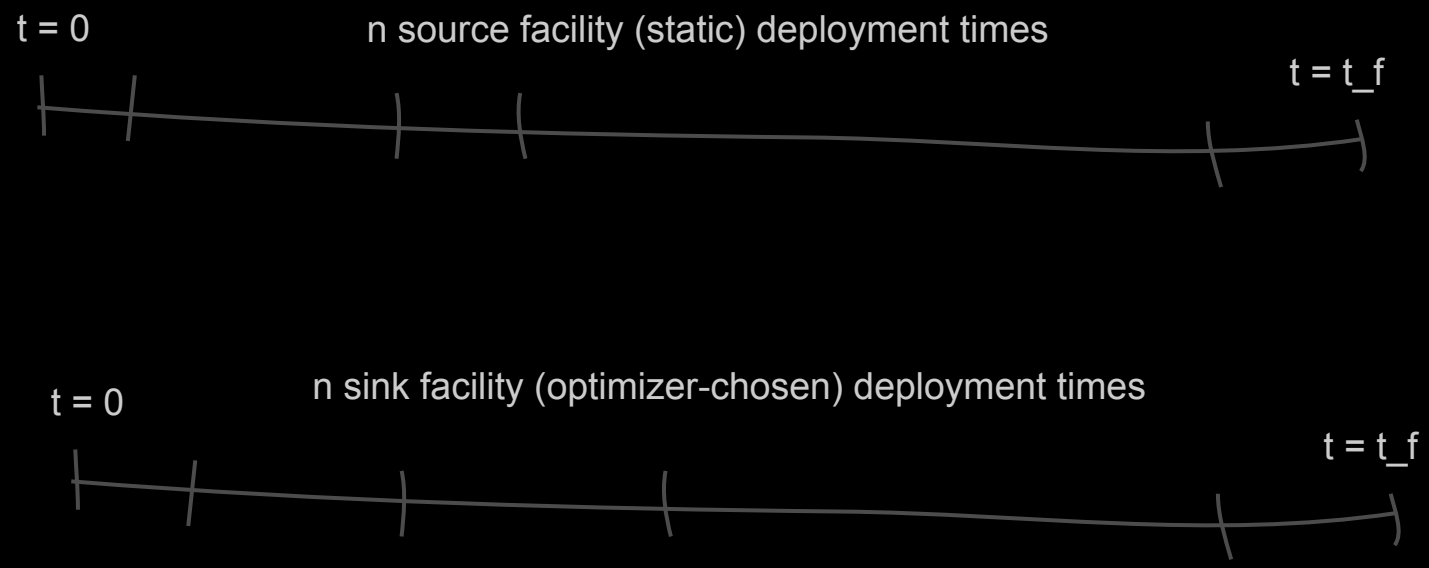
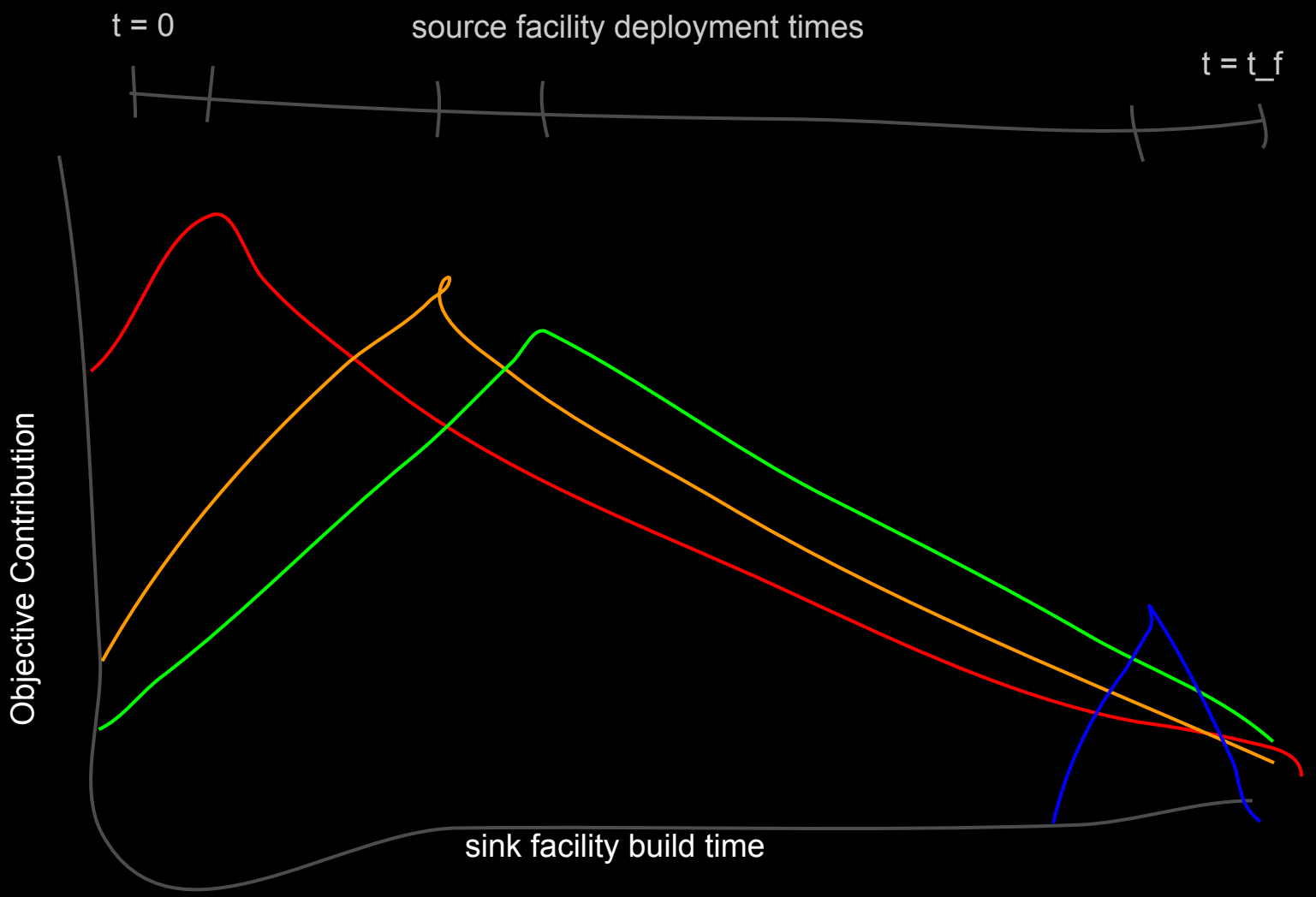
Cyclus-DAKOTA Optimization

Scenario

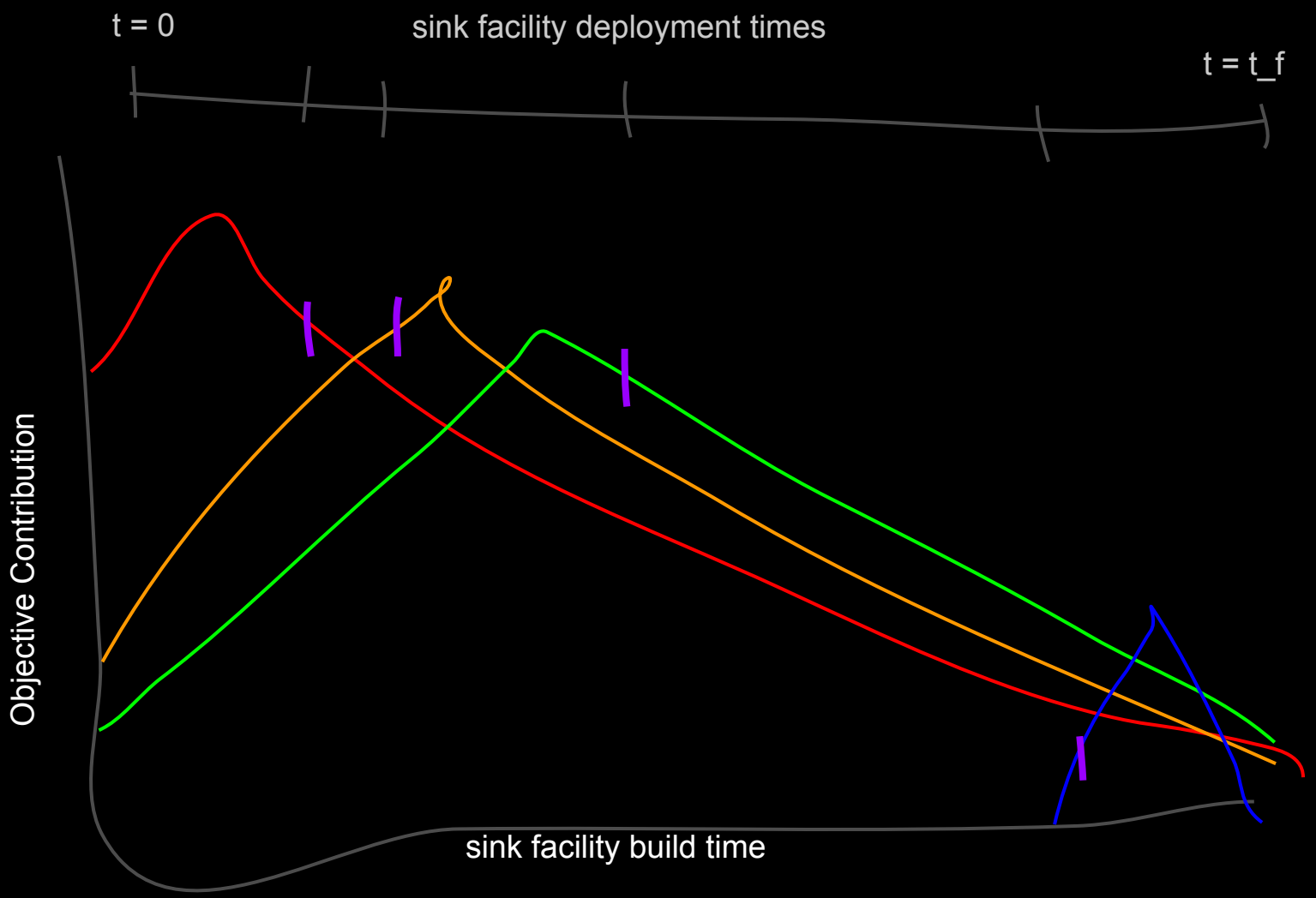


M = [sim-total transacted resource qty] / [cumulative agent operating time]
M = M(sink1, sink2, …, sink_n)
want max(M)

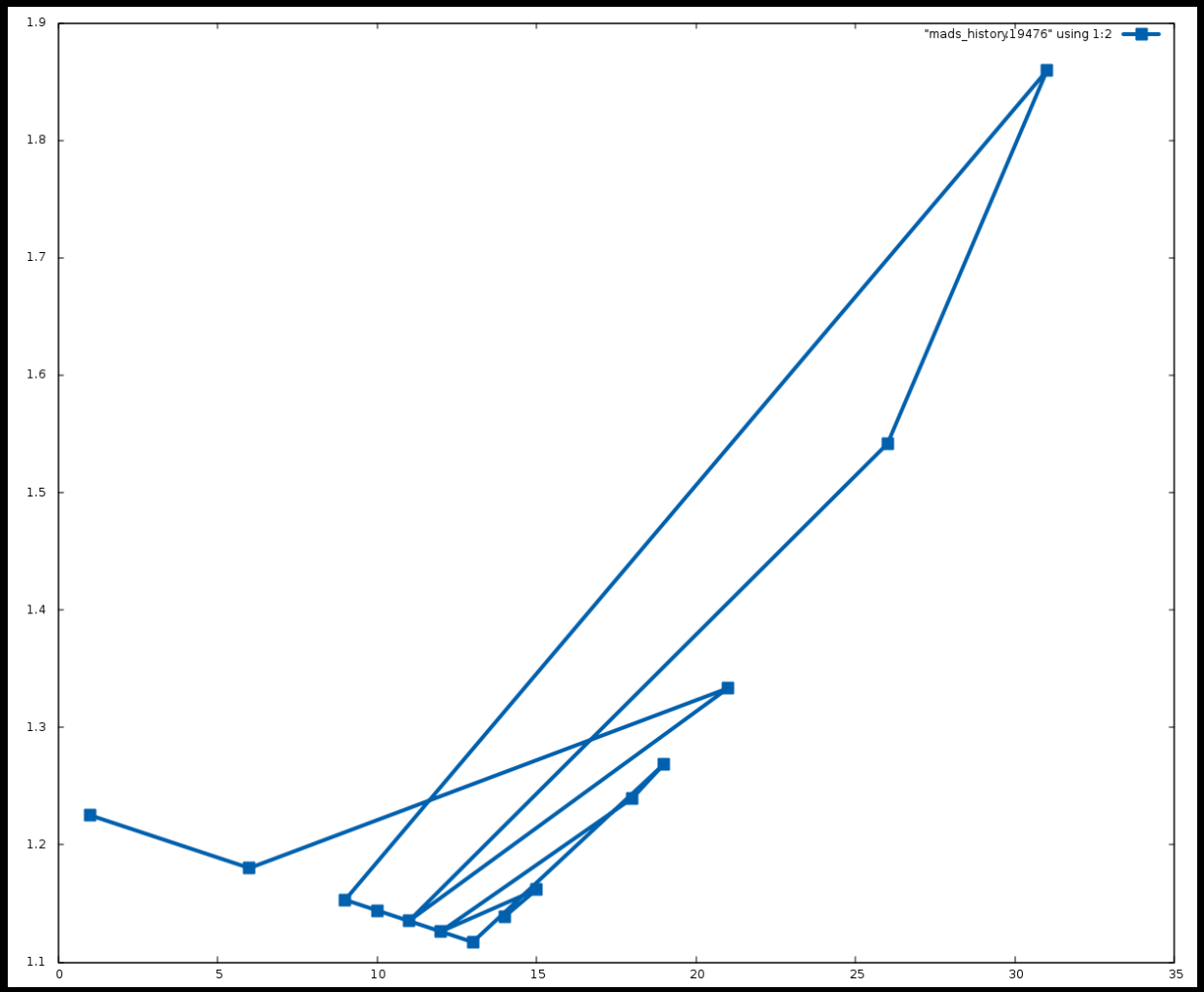
Pseudo Linear Independence



Pseudo Linear Independence



1-D Convergence



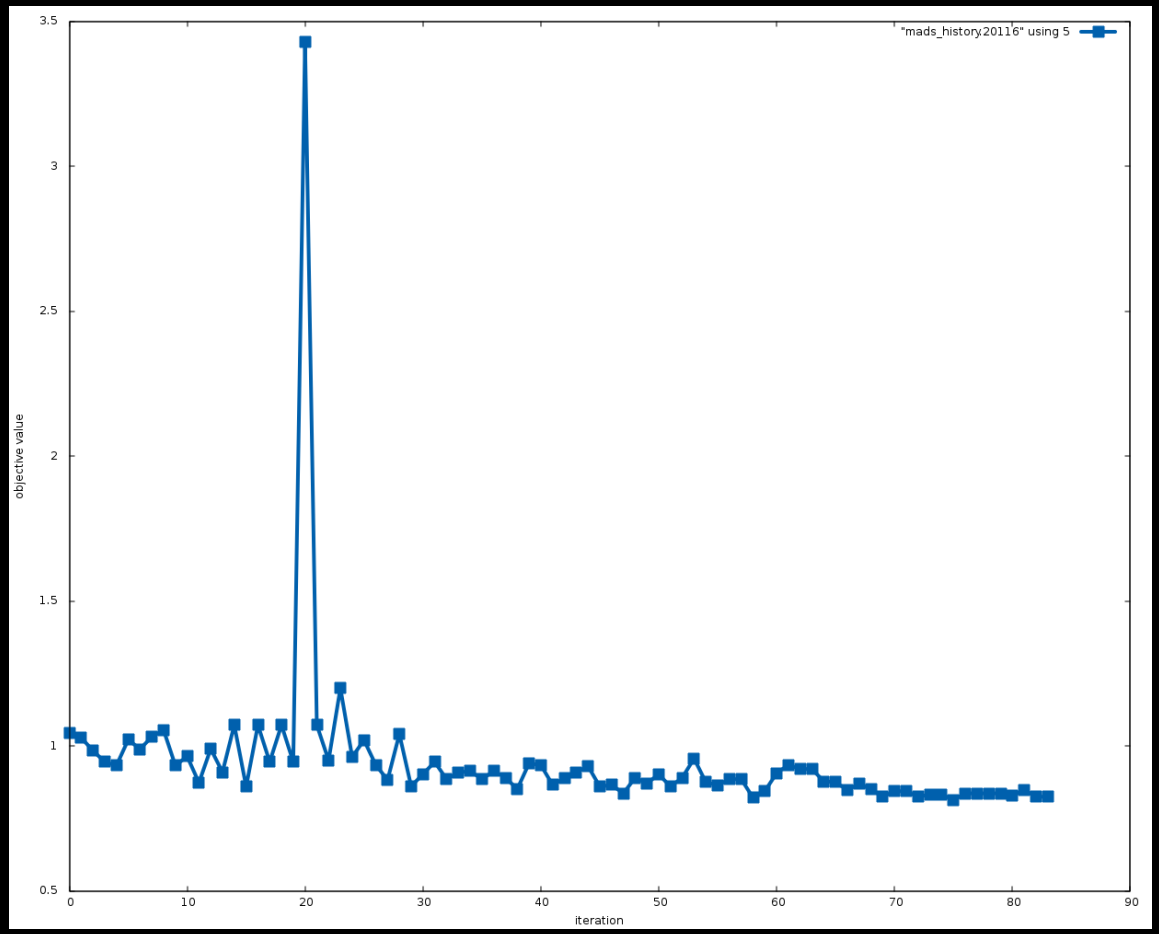
Dakota Input File (snippet)

```
{{$dot := .}}
variables
    discrete_design_range = {{len .InitialSinks}}
        initial_point     {{range .InitialSinks}}{{.}} {{end}}
        lower_bounds      {{range .InitialSinks}}1 {{end}}
        upper_bounds      {{range .InitialSinks}}{{$dot.SimDur}}
{{end}}
        descriptors       {{range $i, $val := .InitialSinks}}'x{{$i}}'
{{end}}

interface
    fork
        analysis_driver = 'cycdriver -spec={{.Spec}}'
```

```
variables
    discrete_design_range = 4
        initial_point     1 1 1 1
        lower_bounds      1 1 1 1
        upper_bounds      20 20 20 20
        descriptors       'x0' 'x1' 'x2' 'x3'

interface
    fork
        analysis_driver = 'cycdriver -spec=spec.json'
```

```
{
    "CyclusTmpl": "musky_cheese.xml",
    "DakotaTmpl": "dakota.in",
    "DakotaInfile": "dakota.gen.in",
    "CyclusBin": "/home/r/cyc/bin/cyclus",
    "SimDur": 20,
    "InitialSinks": [
            1,
            1,
            1,
            1
        ],
    "SourceFacs": [
            1,
            7,
            9,
            18
        ]
}
```

4D Iteration Convergence



objective value

Iteration