**Comparison performance on example 2-QP**

Consider the following optimization problem:

minimize\_x 1/2x^TQx+r^Tx subjection Ax=b, xi in [*l*i,ui]

We use the same settings as in (Zhang-Luo, SIOPT 2020). According to (Zhang-Luo, SIOPT 2020), the inexact ALM they considered oscillates for this optimization problem, while the proximal inexact ALM proposed in (Zhang-Luo, SIOPT 2020) converges with a sufficiently small step size. Actually, when eta=1, then proximal-iALM reduces to iALM.

**Algorithm 1**: Proximal inexact Augmented Lagrangian Method with the following parameter settings:

Penalty parameter: beta=50;

Inverse of proximal parameter: p=2||Q||;

Primal stepsize:0<s<1/(||Q||+p+Gamma\*||A||^2); (plays the similar role of the proximal parameter gamma in LiMEAL)

Dual stepsize: alpha = beta/4; (plays the similar role of the penalty parameter beta in LiMEAL)

z-stepsize:

1) eta = 0.5 (c)

2) eta = 1(m) (when eta=1 reducing to iALM)

**Algorithm 2**: LiMEAL with different parameters

Proximal parameter: gamma = 1/||Q||;

Dual stepsize (penalty parameter): beta = 50;

z-stepsize:

1. eta = 0.5; (b)
2. eta = 1; (r)
3. eta = 1.5. (k)

Four curves:

1. Objective function; 2) constraint violation ||Ax-b||; 3) primal residual ||x^(k+1)-z^k|| 4) stationary error of LiMEAL







