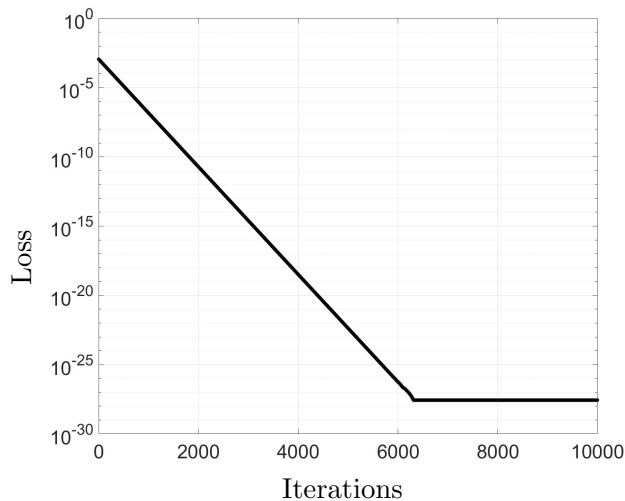


## Quadratic potential

$$V(r) = k(r - a)^2$$

- Generate data  
 $\{k = 1, k^* = 1, a = 1, a^* = 1.2\}$   
 $\{x_1 = 0.933, x_2 = 2.067\}$
- Estimate positions and parameters  
 Guess  $\rightarrow \{k = 0.9, k^* = 1.1, a = 1.1, a^* = 1.1\}$



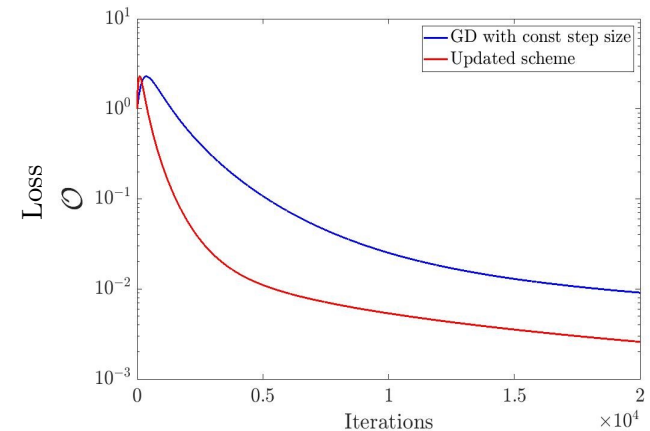
### Output parameter set

$$\{k = 0.89, k^* = 1.1, a = 1.02, a^* = 1.2\}$$

## Lennard Jones potential

$$V(r) = \frac{A}{r^{12}} - \frac{B}{r^6}$$

- Generate data  
 $\{A = 1, A^* = 1.1, B = 2, B^* = 2\}$   
 $\{x_1 = 0.985, x_2 = 1.984\}$
- Estimate positions and parameters  
 Guess  $\rightarrow \{A = 0.9, A^* = 1.2, B = 2.2, B^* = 2.1\}$



### Output parameter set

$$\{A = 1.8, A^* = 1.92, B = 2.1, B^* = 1.75\}$$