

**a**

Relative error

1.0

0.8

0.6

0.4

0.2

0.0

QNPSA\_PSR

QNPSA\_SPSA

QN\_PSR

Cobyla

**b**

Relative error

1.0

0.8

0.6

0.4

0.2

0.0

QNPSA\_PSR

QNPSA\_SPSA

QN\_PSR

Cobyla

0

100

200

300

400

500

Iterations

