

Machine Learning: Programming Exercise 3

Multi-class Classification and Neural Networks

In this exercise, you will implement one-vs-all logistic regression and neural networks to recognize hand-written digits.

Files needed for this exercise

- `ex3.mlx` - MATLAB Live Script that steps you through the exercise
- `ex3data1.mat` - Training set of hand-written digits
- `ex3weights.mat` - Initial weights for the neural network exercise
- `submit.m` - Submission script that sends your solutions to our servers
- `displayData.m` - Function to help visualize the dataset
- `fmincg.m` - Function minimization routine (similar to `fminunc`)
- `sigmoid.m` - Sigmoid function
- `*lrCostFunction.m` - Logistic regression cost function
- `*oneVsAll.m` - Train a one-vs-all multi-class classifier
- `*predictOneVsAll.m` - Predict using a one-vs-all multi-class classifier
- `*predict.m` - Neural network prediction function

**indicates files you will need to complete*

Clear existing variables and confirm that your Current Folder is set correctly

Click into this section, then click the 'Run Section' button above. This will execute the `clear` command to clear existing variables and the `dir` command to list the files in your Current Folder. The output should contain all of the files listed above and the 'lib' folder. If it does not, right-click the 'ex3' folder and select 'Open' before proceeding or see the instructions in `README.mlx` for more details.

```
clear
dir
```

.	<code>ex3.mlx</code>	<code>ex3data1.mat</code>	<code>lrCostFunction.asv</code>	<code>oneVsAll.m</code>	p
..	<code>ex3_companion.mat</code>	<code>ex3weights.mat</code>	<code>lrCostFunction.m</code>	<code>predict.m</code>	s
<code>displayData.m</code>	<code>ex3_companion.mlx</code>	<code>fmincg.m</code>	<code>oneVsAll.asv</code>	<code>predictOneVsAll.asv</code>	s

Before you begin

The workflow for completing and submitting the programming exercises in MATLAB Online differs from the original course instructions. Before beginning this exercise, make sure you have read through the instructions in `README.mlx` which is included with the programming exercise files. `README` also contains solutions to the many common issues you may encounter while completing and submitting the exercises in MATLAB Online. Make sure you are following instructions in `README` and have checked for an existing solution before seeking help on the discussion forums.

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1. Multi-class Classification

For this exercise, you will use logistic regression and neural networks to recognize handwritten digits (from 0 to 9). Automated handwritten digit recognition is widely used today - from recognizing zip codes (postal codes) on mail envelopes to recognizing amounts written on bank checks. This exercise will show you how the methods you've learned can be used for this classification task. In the first part of the exercise, you will extend your previous implementation of logistic regression and apply it to one-vs-all classification.

1.1 Dataset

You are given a data set in `ex3data1.mat` that contains 5000 training examples of handwritten digits*. The `.mat` format means that the data has been saved in a native MATLAB matrix format, instead of a text (ASCII) format like a csv-file. These matrices can be read directly into your program by using the `load` command. After loading, matrices of the correct dimensions and values will appear in your program's memory. The matrix will already be named, so you do not need to assign names to them.

**This is a subset of the MNIST [handwritten digit dataset](#)*

Run the code below to load the data.

```
% Load saved matrices from file
load('ex3data1.mat');
% The matrices X and y will now be in your MATLAB environment
```

There are 5000 training examples in `ex3data1.mat`, where each training example is a 20 pixel by 20 pixel grayscale image of the digit. Each pixel is represented by a floating point number indicating the grayscale intensity at that location. The 20 by 20 grid of pixels is 'unrolled' into a 400-dimensional vector. Each of these training examples becomes a single row in our data matrix `x`. This gives us a 5000 by 400 matrix `x` where every row is a training example for a handwritten digit image.

$$X = \begin{bmatrix} -(x^{(1)})^T & - \\ -(x^{(2)})^T & - \\ \vdots & \\ -(x^{(m)})^T & - \end{bmatrix}$$

The second part of the training set is a 5000-dimensional vector y that contains labels for the training set. To make things more compatible with MATLAB indexing, where there is no zero index, we have mapped the digit zero to the value ten. Therefore, a '0' digit is labeled as '10', while the digits '1' to '9' are labeled as '1' to '9' in their natural order.

1.2 Visualizing the data

You will begin by visualizing a subset of the training set. The code below randomly selects 100 rows from X and passes those rows to the `displayData` function. This function maps each row to a 20 pixel by 20 pixel grayscale image and displays the images together. We have provided the `displayData` function, and you are encouraged to examine the code to see how it works. After you run this step, you should see an image like Figure 1.



Figure 1: Examples from the dataset

```
m = size(X, 1);
% Randomly select 100 data points to display
rand_indices = randperm(m);
sel = X(rand_indices(1:100), :);
displayData(sel);
```

8	6	5	4	5	4	9	7	0	2
1	2	9	6	3	8	4	4	8	1
8	0	7	4	8	7	2	7	9	8
2	4	4	6	0	2	0	0	7	6
7	8	5	2	0	4	4	5	6	4
0	5	1	7	1	6	9	3	5	1
7	8	4	4	8	5	7	1	5	5
2	1	1	3	9	6	6	6	5	2
9	6	3	0	4	6	7	9	7	2
3	9	7	6	6	2	3	7	1	1

1.3 Vectorizing logistic regression

You will be using multiple one-vs-all logistic regression models to build a multi-class classifier. Since there are 10 classes, you will need to train 10 separate logistic regression classifiers. To make this training efficient, it is important to ensure that your code is well vectorized. In this section, you will implement a vectorized version of logistic regression that does not employ any `for` loops. You can use your code in the last exercise as a starting point for this exercise.

1.3.1 Vectorizing the cost function

We will begin by writing a vectorized version of the cost function. Recall that in (unregularized) logistic regression, the cost function is

$$J(\theta) = \frac{1}{m} \sum_{i=1}^m [-y^{(i)} \log(h_{\theta}(x^{(i)})) - (1 - y^{(i)}) \log(1 - h_{\theta}(x^{(i)}))],$$

To compute each element in the summation, we have to compute $h_{\theta}(x^{(i)})$ for every example i , where

$h_{\theta}(x^{(i)}) = g(\theta^T x^{(i)})$ and $g(z) = \frac{1}{1 + e^{-z}}$ is the sigmoid function. It turns out that we can compute this quickly for

all our examples by using matrix multiplication. Let us define X and θ as

$$X\theta = \begin{bmatrix} -(x^{(1)})^T \theta - \\ -(x^{(2)})^T \theta - \\ \vdots \\ -(x^{(m)})^T \theta - \end{bmatrix} = \begin{bmatrix} -\theta^T(x^{(1)}) - \\ -\theta^T(x^{(2)}) - \\ \vdots \\ -\theta^T(x^{(m)}) - \end{bmatrix}$$

In the last equality, we used the fact that $a^T b = b^T a$ if a and b are vectors. This allows us to compute the products $\theta^T x^{(i)}$ for all our examples i in one line of code.

Your job is to write the unregularized cost function in the file `lrCostFunction.m`. Your implementation should use the strategy we presented above to calculate $\theta^T x^{(i)}$. You should also use a vectorized approach for the rest of the cost function. A fully vectorized version of `lrCostFunction.m` should not contain any loops. (Hint: You might want to use the element-wise multiplication operation `(.*)` and the sum operation `sum` when writing this function)

1.3.2 Vectorizing the gradient

Recall that the gradient of the (unregularized) logistic regression cost is a vector where the j th element is defined as

$$\frac{\partial J(\theta)}{\partial \theta_j} = \frac{1}{m} \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)}) x_j^{(i)}$$

To vectorize this operation over the dataset, we start by writing out all the partial derivatives explicitly for all θ_j ,

$$\begin{bmatrix} \frac{\partial J(\theta)}{\partial \theta_0} \\ \frac{\partial J(\theta)}{\partial \theta_1} \\ \frac{\partial J(\theta)}{\partial \theta_2} \\ \vdots \\ \frac{\partial J(\theta)}{\partial \theta_n} \end{bmatrix} = \frac{1}{m} \begin{bmatrix} \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)}) x_0^{(i)} \\ \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)}) x_1^{(i)} \\ \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)}) x_2^{(i)} \\ \vdots \\ \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)}) x_n^{(i)} \end{bmatrix} = \frac{1}{m} \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)}) x^{(i)} = \frac{1}{m} X^T (h_{\theta}(x) - y) \quad (1)$$

where

$$h_{\theta}(x) - y = \begin{bmatrix} h_{\theta}(x^{(1)}) - y^{(1)} \\ h_{\theta}(x^{(2)}) - y^{(2)} \\ \vdots \\ h_{\theta}(x^{(m)}) - y^{(m)} \end{bmatrix}$$

Note that $x^{(i)}$ is a vector, while $(h_{\theta}(x^{(i)}) - y^{(i)})$ is a scalar (single number). To understand the last step of the derivation, let $\beta_i = (h_{\theta}(x^{(i)}) - y^{(i)})$ and observe that:

$$\sum_i \beta_i x^{(i)} = \begin{bmatrix} | & | & & | \\ x^{(1)} & x^{(2)} & \dots & x^{(m)} \\ | & | & & | \end{bmatrix} \begin{bmatrix} \beta_1 \\ \beta_2 \\ \vdots \\ \beta_m \end{bmatrix} = X^T \beta,$$

The expression above allows us to compute all the partial derivatives without any loops. If you are comfortable with linear algebra, we encourage you to work through the matrix multiplications above to convince yourself that the vectorized version does the same computations. You should now implement Equation (1) to compute the correct vectorized gradient. Once you are done, complete the function `lrCostFunction.m` by implementing the gradient.

Debugging Tip: Vectorizing code can sometimes be tricky. One common strategy for debugging is to print out the sizes of the matrices you are working with using the `size` function. For example, given a data matrix X of size 100 x 20 (100 examples, 20 features) and θ , a vector with dimensions 20 x 1, you can observe that $X\theta$ is a valid multiplication operation, while θX is not. Furthermore, if you have a non-vectorized version of your code, you can compare the output of your vectorized code and non-vectorized code to make sure that they produce the same outputs.

1.3.3 Vectorizing regularized logistic regression

After you have implemented vectorization for logistic regression, you will now add regularization to the cost function. Recall that for regularized logistic regression, the cost function is defined as

$$J(\theta) = \frac{1}{m} \sum_{i=1}^m [-y^{(i)} \log(h_{\theta}(x^{(i)})) - (1 - y^{(i)}) \log(1 - h_{\theta}(x^{(i)}))] + \frac{\lambda}{2m} \sum_{j=1}^n \theta_j^2$$

Note that you should not be regularizing θ_0 which is used for the bias term. Correspondingly, the partial derivative of regularized logistic regression cost for θ_j is defined as

$$\frac{\partial J(\theta)}{\partial \theta_j} = \frac{1}{m} \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)}) x_j^{(i)} \quad \text{for } j = 0,$$

$$\frac{\partial J(\theta)}{\partial \theta_j} = \left(\frac{1}{m} \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)}) x_j^{(i)} \right) + \frac{\lambda}{m} \theta_j \quad \text{for } j \geq 1$$

Now modify your code in `lrCostFunction` to account for regularization. Once again, you should not put any loops into your code. When you are finished, run the code below to test your vectorized implementation and compare to expected outputs:

```
theta_t = [-2; -1; 1; 2];
X_t = [ones(5,1) reshape(1:15,5,3)/10];
y_t = ([1;0;1;0;1] >= 0.5);
lambda_t = 3;
[J, grad] = lrCostFunction(theta_t, X_t, y_t, lambda_t);
```

```
theta = 4x1
    0
   -1
    1
    2
E = 5x1
   -0.3318
    0.7109
   -0.2497
    0.7858
   -0.1824
```

```
fprintf('Cost: %f | Expected cost: 2.534819\n',J);
```

```
Cost: 2.534819 | Expected cost: 2.534819
```

```
fprintf('Gradients:\n'); fprintf('%f\n',grad);
```

```
Gradients:
0.146561
-0.548558
0.724722
1.398003
```

```
fprintf('Expected gradients:\n 0.146561\n -0.548558\n 0.724722\n 1.398003');
```

```
Expected gradients:
0.146561
-0.548558
0.724722
1.398003
```

MATLAB Tip: When implementing the vectorization for regularized logistic regression, you might often want to only sum and update certain elements of θ . In MATLAB, you can index into the matrices to access and update only certain elements. For example, `A(:,3:5) = B(:, 1:3)` will replace columns 3 to 5 of `A` with the columns 1 to 3 from `B`. One special keyword you can use in indexing is the `end` keyword in indexing. This allows us to select columns (or rows) until the end of the matrix. For example, `A(:, 2:end)` will only return elements from the 2nd to last column of `A`. Thus, you could use this together with the `sum` and `.^` operations to compute the sum of only the elements you are interested in (e.g. `sum(z(2:end).^2)`). In the starter code, `lrCostFunction.m`, we have also provided hints on yet another possible method computing the regularized gradient.

*You should now submit your solutions. Enter **submit** at the command prompt, then enter or confirm your login and token when prompted.*

1.4 One-vs-all classification

In this part of the exercise, you will implement one-vs-all classification by training multiple regularized logistic regression classifiers, one for each of the K classes in our dataset (Figure 1). In the handwritten digits dataset, $K = 10$, but your code should work for any value of K .

You should now complete the code in `oneVsAll.m` to train one classifier for each class. In particular, your code should return all the classifier parameters in a matrix $\Theta \in \mathbb{R}^{K \times (N+1)}$, where each row of Θ corresponds to the learned logistic regression parameters for one class. You can do this with a `for` loop from 1 to K , training each classifier independently.

Note that the y argument to this function is a vector of labels from 1 to 10, where we have mapped the digit '0' to the label 10 (to avoid confusions with indexing). When training the classifier for class $k \in \{1, \dots, K\}$, you will want a m -dimensional vector of labels y , where $y_j \in \{0, 1\}$ indicates whether the j -th training instance belongs to class k ($y_j = 1$), or if it belongs to a different class ($y_j = 0$). You may find logical arrays helpful for this task.

MATLAB Tip: Logical arrays in MATLAB are arrays which contain binary (0 or 1) elements. In MATLAB, evaluating the expression `a == b` for a vector `a` (of size $m \times 1$) and scalar `b` will return a vector of the same size as `a` with ones at positions where the elements of `a` are equal to `b` and zeroes where they are different. To see how this works for yourself, run the following code:

```
a = 1:10; % Create a and b
b = 3;
disp(a == b) % You should try different values of b here
```

0 0 1 0 0 0 0 0 0 0

Furthermore, you will be using `fmincg` for this exercise (instead of `fminunc`). `fmincg` works similarly to `fminunc`, but is more more efficient for dealing with a large number of parameters. After you have correctly completed the code for `oneVsAll.m`, run the code below to use your `oneVsAll` function to train a multi-class classifier.

```
num_labels = 10; % 10 labels, from 1 to 10
lambda = 0.1;
[all_theta] = oneVsAll(X, y, num_labels, lambda);
```

theta = 401x1

$$\begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ \vdots \end{pmatrix}$$
$$E = 5000 \times 1$$

0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000


```

0.5000
0.5000
0.5000
⋮
⋮
theta = 401×1
0
0
0
0.0000
-0.0000
0.0000
-0.0000
-0.0000
-0.0000
-0.0000
-0.0000
⋮
⋮
E = 5000×1
0.1089
0.0953
0.0646
0.0667
0.0641
0.0814
0.0570
0.2528
0.0479
0.0870
⋮
⋮
Iteration      1 | Cost: 2.802128e-01
theta = 401×1
0
0
0
0.0000
-0.0000
-0.0000
-0.0002
-0.0001
0.0001
-0.0001
⋮
⋮
E = 5000×1
0.0005
0.0011
0.0004
0.0002
0.0000
0.0000
0.0001
0.0203
0.0000
0.0004
⋮
⋮
Iteration      2 | Cost: 9.454389e-02
theta = 401×1
0
0
0
0.0000

```

```

-0.0000
-0.0000
-0.0002
-0.0002
0.0001
-0.0001
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
0.0000
-0.0000
-0.0000
-0.0002
-0.0001
0.0001
-0.0001
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0028
0.0000
0.0000
:
:
theta = 401×1
0
0
0
0.0000
-0.0000
-0.0000
-0.0002
-0.0001
0.0001
-0.0001
:
:
E = 5000×1
0.0001
0.0001
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0075
0.0000
0.0000
⋮
⋮
Iteration      3 | Cost: 5.704641e-02
theta = 401x1
      0
      0
      0
0.0000
-0.0000
-0.0000
-0.0002
0.0001
0.0008
-0.0001
⋮
⋮
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0002
0.0000
0.0000
⋮
⋮
theta = 401x1
      0
      0
      0
0.0000
-0.0000
-0.0000
-0.0002
-0.0000
0.0003
-0.0001
⋮
⋮
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0020
0.0000
0.0000
⋮
⋮
Iteration      4 | Cost: 4.688190e-02
theta = 401x1

```

```

0
0
0
0.0000
-0.0000
-0.0001
-0.0002
0.0005
0.0018
-0.0002
:
:
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      5 | Cost: 3.759021e-02
theta = 401x1
0
0
0
0.0000
-0.0001
-0.0001
-0.0003
0.0009
0.0031
-0.0002
:
:
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0001
-0.0001
-0.0002
0.0006
0.0021
-0.0002

```

```

      :
      :
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
      :
      :
Iteration      6 | Cost: 3.522008e-02
theta = 401x1
      0
      0
      0
0.0000
-0.0001
-0.0001
-0.0003
0.0006
0.0027
-0.0002
      :
      :
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
      :
      :
Iteration      7 | Cost: 3.234531e-02
theta = 401x1
      0
      0
      0
0.0000
-0.0001
-0.0001
-0.0002
0.0002
0.0029
-0.0001
      :
      :
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
⋮
⋮
theta = 401×1
0
0
0
0.0000
-0.0001
-0.0001
-0.0002
0.0005
0.0027
-0.0002
⋮
⋮
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
⋮
⋮
Iteration      8 | Cost: 3.145034e-02
theta = 401×1
0
0
0
0.0000
-0.0001
-0.0001
-0.0002
0.0003
0.0028
-0.0001
⋮
⋮
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
⋮
⋮
Iteration      9 | Cost: 3.008919e-02
theta = 401×1
0
0
0
0.0000

```

```

-0.0001
-0.0001
-0.0002
0.0003
0.0027
-0.0001
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
0.0000
-0.0001
-0.0001
-0.0002
0.0003
0.0028
-0.0001
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    10 | Cost: 2.994639e-02
theta = 401×1
0
0
0
0.0000
-0.0001
-0.0001
-0.0002
0.0003
0.0027
-0.0001
:
:
E = 5000×1
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0001
-0.0001
-0.0002
0.0002
0.0027
-0.0001
:
:
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0001
-0.0001
-0.0002
-0.0000
0.0027
-0.0001
:
:
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0

```



```

0
0
0.0000
-0.0001
-0.0001
-0.0002
-0.0005
0.0026
-0.0001
:
:
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    11 | Cost: 2.678528e-02
theta = 401x1
0
0
0
0.0000
-0.0001
-0.0001
-0.0000
-0.0019
0.0022
-0.0000
:
:
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0001
-0.0001
-0.0001
-0.0006
0.0025
-0.0001
:
:

```

```
E = 5000x1
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    ⋮
theta = 401x1
      0
      0
      0
    0.0000
   -0.0001
   -0.0001
   -0.0002
   -0.0006
    0.0025
   -0.0001
    ⋮
E = 5000x1
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    ⋮
Iteration      12 | Cost: 2.660323e-02
theta = 401x1
      0
      0
      0
    0.0000
   -0.0001
   -0.0001
   -0.0001
   -0.0007
    0.0025
   -0.0001
    ⋮
E = 5000x1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
```

```

0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0001
-0.0001
-0.0001
-0.0009
0.0025
-0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0001
-0.0001
-0.0001
-0.0014
0.0023
-0.0000
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    13 | Cost: 2.493301e-02
theta = 401x1
0
0
0
0.0000
-0.0001

```

```

-0.0002
0.0000
-0.0028
0.0020
0.0000
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
0.0000
-0.0001
-0.0001
-0.0001
-0.0016
0.0023
-0.0000
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    14 | Cost: 2.475211e-02
theta = 401×1
0
0
0
0.0000
-0.0001
-0.0001
-0.0000
-0.0018
0.0022
-0.0000
:
:
E = 5000×1
1.0e+00 *

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0001
-0.0001
-0.0000
-0.0021
0.0022
-0.0000
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0002
-0.0002
0.0001
-0.0032
0.0019
0.0000
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

```

```

      :
      :
Iteration    15 | Cost: 2.318421e-02
theta = 401x1
      0
      0
      0
      0.0000
     -0.0002
     -0.0002
      0.0002
     -0.0049
      0.0016
      0.0001
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
      0.0000
     -0.0002
     -0.0002
      0.0001
     -0.0035
      0.0019
      0.0001
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration    16 | Cost: 2.287050e-02
theta = 401x1
      0
      0
      0
      0.0000
     -0.0002

```

```

-0.0002
 0.0001
-0.0039
 0.0018
 0.0001
  :
  :
E = 5000×1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  :
  :
theta = 401×1
 0
 0
 0
 0.0000
-0.0002
-0.0002
 0.0002
-0.0046
 0.0017
 0.0001
  :
  :
E = 5000×1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  :
  :
Iteration    17 | Cost: 2.160258e-02
theta = 401×1
 0
 0
 0
 0.0000
-0.0002
-0.0002
 0.0002
-0.0044
 0.0018
 0.0001
  :
  :
E = 5000×1
1.0e+00 *

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
      0
      0
      0
0.0000
-0.0002
-0.0002
0.0002
-0.0045
0.0018
0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      18 | Cost: 2.120371e-02
theta = 401x1
      0
      0
      0
0.0000
-0.0002
-0.0002
0.0002
-0.0044
0.0018
0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

```



```

0.0000
:
:
Iteration    19 | Cost: 2.064125e-02
theta = 401x1
0
0
0
0.0000
-0.0002
-0.0002
0.0002
-0.0046
0.0018
0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0002
-0.0002
0.0002
-0.0045
0.0018
0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    20 | Cost: 2.055695e-02
theta = 401x1
0
0
0
0.0000

```

```

-0.0002
-0.0002
0.0002
-0.0045
0.0018
0.0001
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    21 | Cost: 2.045466e-02
theta = 401×1
0
0
0
0.0000
-0.0002
-0.0002
0.0002
-0.0045
0.0018
0.0001
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
0.0000
-0.0002
-0.0002
0.0002
-0.0045
0.0018
0.0001
:
:
E = 5000×1

```

```
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
```

-
-
-

```
Iteration    22 | Cost: 2.029177e-02
```

```
theta = 401x1
```

```

0
0
0
0.0000
-0.0002
-0.0002
0.0002
-0.0046
0.0018
0.0001

```

-
-
-

$$E = 5000 \times 1$$

```
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
```

-
-
-

```
Iteration    23 | Cost: 2.005296e-02
```

```
theta = 401x1
```

```

0
0
0
0.0000
-0.0002
-0.0002
0.0002
-0.0046
0.0019
0.0001

```

-
-
-

$$E = 5000 \times 1$$

```
1.0e+00 *
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
```

```

0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0002
-0.0002
0.0002
-0.0046
0.0018
0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    24 | Cost: 1.995949e-02
theta = 401x1
0
0
0
0.0000
-0.0002
-0.0002
0.0002
-0.0046
0.0019
0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    25 | Cost: 1.982849e-02
theta = 401x1
0
0

```

```

0
0.0000
-0.0002
-0.0002
0.0002
-0.0047
0.0019
0.0001
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    26 | Cost: 1.975129e-02
theta = 401×1
0
0
0
0.0000
-0.0002
-0.0003
0.0002
-0.0048
0.0019
0.0001
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
0.0000
-0.0002
-0.0003
0.0002
-0.0050
0.0019
0.0001

```

```

      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
theta = 401×1
      0
      0
      0
    0.0000
   -0.0003
   -0.0003
    0.0003
   -0.0055
    0.0019
    0.0001
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
Iteration    27 | Cost: 1.897815e-02
theta = 401×1
      0
      0
      0
    0.0000
   -0.0004
   -0.0004
    0.0004
   -0.0070
    0.0020
    0.0001
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0003
-0.0003
0.0003
-0.0057
0.0019
0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    28 | Cost: 1.887065e-02
theta = 401x1
0
0
0
0.0000
-0.0003
-0.0004
0.0003
-0.0061
0.0019
0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    29 | Cost: 1.869107e-02
theta = 401x1

```

```

0
0
0
0.0000
-0.0003
-0.0004
0.0003
-0.0060
0.0019
0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0003
-0.0004
0.0003
-0.0061
0.0019
0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration 30 | Cost: 1.863223e-02
theta = 401x1
0
0
0
0.0000
-0.0003
-0.0004
0.0003
-0.0061
0.0019

```



```

0.0001
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
0.0000
-0.0003
-0.0003
0.0003
-0.0061
0.0019
0.0001
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    31 | Cost: 1.837393e-02
theta = 401×1
0
0
0
0.0000
-0.0003
-0.0004
0.0004
-0.0064
0.0018
0.0001
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      32 | Cost: 1.816950e-02
theta = 401x1
0
0
0
0.0000
-0.0003
-0.0004
0.0004
-0.0066
0.0017
0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0003
-0.0004
0.0004
-0.0069
0.0016
0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      33 | Cost: 1.781689e-02

```

```

theta = 401x1
    0
    0
    0
    0.0000
   -0.0004
   -0.0004
    0.0006
   -0.0084
    0.0010
    0.0002
    :
    :

```

```

E = 5000x1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :

```

```

theta = 401x1
    0
    0
    0
    0.0000
   -0.0003
   -0.0004
    0.0004
   -0.0071
    0.0015
    0.0002
    :
    :

```

```

E = 5000x1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :

```

```

Iteration    34 | Cost: 1.774664e-02

```

```

theta = 401x1
    0
    0
    0
    0.0000
   -0.0003
   -0.0004
    0.0004
   -0.0071

```

```

0.0015
0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    35 | Cost: 1.767442e-02
theta = 401×1
0
0
0
0.0000
-0.0003
-0.0004
0.0004
-0.0071
0.0015
0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    36 | Cost: 1.758469e-02
theta = 401×1
0
0
0
0.0000
-0.0003
-0.0004
0.0005
-0.0073
0.0015
0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
0.0000
-0.0003
-0.0004
0.0004
-0.0072
0.0015
0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    37 | Cost: 1.756884e-02
theta = 401x1
0
0
0
0.0000
-0.0003
-0.0004
0.0004
-0.0072
0.0015
0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

```

```

      :
      :
theta = 401x1
      0
      0
      0
      0.0000
     -0.0003
     -0.0004
      0.0004
     -0.0072
      0.0015
      0.0002
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration    38 | Cost: 1.753422e-02
theta = 401x1
      0
      0
      0
      0.0000
     -0.0004
     -0.0004
      0.0005
     -0.0073
      0.0015
      0.0002
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
      0.0000
     -0.0004
     -0.0004

```

```

0.0005
-0.0075
0.0014
0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
0.0000
-0.0004
-0.0004
0.0005
-0.0079
0.0013
0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    39 | Cost: 1.728293e-02
theta = 401×1
0
0
0
0.0000
-0.0004
-0.0005
0.0006
-0.0087
0.0012
0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    40 | Cost: 1.702073e-02
theta = 401x1
      0
      0
      0
      0.0000
     -0.0004
     -0.0005
      0.0007
     -0.0094
      0.0010
      0.0003
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
      0.0001
     -0.0005
     -0.0006
      0.0008
     -0.0109
      0.0006
      0.0003
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000

```



```

      :
      :
Iteration    41 | Cost: 1.621408e-02
theta = 401x1
      0
      0
      0
      0.0001
     -0.0006
     -0.0007
      0.0010
     -0.0129
      0.0001
      0.0004
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration    42 | Cost: 1.554339e-02
theta = 401x1
      0
      0
      0
      0.0001
     -0.0007
     -0.0008
      0.0012
     -0.0153
     -0.0005
      0.0005
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration    43 | Cost: 1.506051e-02
theta = 401x1
      0
      0
      0
      0.0001

```

```

-0.0009
-0.0010
 0.0016
-0.0194
-0.0015
 0.0006
  :
  :
E = 5000×1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  :
  :
theta = 401×1
      0
      0
      0
    0.0001
   -0.0008
   -0.0009
    0.0014
   -0.0174
   -0.0009
    0.0006
     :
     :
E = 5000×1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  :
  :
Iteration    44 | Cost: 1.472395e-02
theta = 401×1
      0
      0
      0
    0.0001
   -0.0008
   -0.0009
    0.0014
   -0.0174
   -0.0009
    0.0006
     :
     :
E = 5000×1

```

```

1.0e+00 *
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  :
  :
Iteration    45 | Cost: 1.452444e-02
theta = 401x1
      0
      0
      0
    0.0001
   -0.0008
   -0.0009
    0.0014
   -0.0174
   -0.0010
    0.0006
      :
      :
E = 5000x1
1.0e+00 *
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  :
  :
theta = 401x1
      0
      0
      0
    0.0001
   -0.0008
   -0.0009
    0.0014
   -0.0174
   -0.0010
    0.0006
      :
      :
E = 5000x1
1.0e+00 *
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000

```

```

0.0000
0.0000
:
Iteration    46 | Cost: 1.443140e-02
theta = 401x1
0
0
0
0.0001
-0.0008
-0.0009
0.0014
-0.0174
-0.0010
0.0006
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
Iteration    47 | Cost: 1.428051e-02
theta = 401x1
0
0
0
0.0001
-0.0008
-0.0009
0.0014
-0.0174
-0.0010
0.0006
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
Iteration    48 | Cost: 1.412396e-02
theta = 401x1
0
0

```

```

      0
      0.0001
     -0.0008
     -0.0009
      0.0014
     -0.0174
     -0.0010
      0.0006
      :
      :
E = 5000×1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401×1
      0
      0
      0
      0.0001
     -0.0008
     -0.0009
      0.0014
     -0.0174
     -0.0010
      0.0006
      :
      :
E = 5000×1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration    49 | Cost: 1.407336e-02
theta = 401×1
      0
      0
      0
      0.0001
     -0.0008
     -0.0009
      0.0014
     -0.0175
     -0.0010
      0.0006

```

```

      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
theta = 401×1
      0
      0
      0
    0.0001
   -0.0008
   -0.0009
    0.0014
   -0.0175
   -0.0010
    0.0006
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
Iteration    50 | Cost: 1.395215e-02
theta = 401×1
      0
      0
      0
      0
      0
      0
      0
      0
      0
      0
      0
      :
      :
E = 5000×1
    0.5000
    0.5000
    0.5000
    0.5000
    0.5000
    0.5000

```

```

0.5000
0.5000
0.5000
0.5000
:
:
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0000
-0.0000
-0.0000
-0.0000
-0.0000
:
:
E = 5000x1
0.1015
0.0849
0.0570
0.0616
0.0598
0.0775
0.0489
0.2592
0.0439
0.0777
:
:
Iteration      1 | Cost: 3.448901e-01
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0004
-0.0004
-0.0002
:
:
E = 5000x1
0.0246
0.0071
0.0149
0.0696
0.0027
0.0140
0.0007
0.9509
0.0034
0.0053
:
:
Iteration      2 | Cost: 3.150694e-01
theta = 401x1
1.0e+00 *

```

```

0
0
0
-0.0000
0.0000
0.0000
-0.0007
-0.0009
-0.0008
-0.0004
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.9189
0.0000
0.0000
:
:
Iteration      3 | Cost: 1.846843e-01
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0001
-0.0044
-0.0044
-0.0046
-0.0015
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.9990
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0025
-0.0027
-0.0027
-0.0009

```



```

      :
      :
E = 5000×1
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.9908
    0.0000
    0.0000
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
    -0.0000
    -0.0016
    -0.0018
    -0.0018
    -0.0018
    -0.0007
      :
      :
E = 5000×1
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.9722
    0.0000
    0.0000
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
    -0.0000
    -0.0012
    -0.0013
    -0.0013
    -0.0005
      :
      :
E = 5000×1
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.9522
    0.0000

```

```

0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0000
-0.0010
-0.0011
-0.0011
-0.0005
:
:
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.9375
0.0000
0.0000
:
:
Iteration      4 | Cost: 1.699017e-01
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0000
-0.0011
-0.0013
-0.0013
-0.0005
:
:
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.7851
0.0000
0.0000
:
:
Iteration      5 | Cost: 1.529566e-01
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0000

```

```

-0.0013
-0.0015
-0.0016
-0.0005
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.7433
0.0000
0.0000
:
:
Iteration      6 | Cost: 1.317377e-01
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0016
-0.0017
-0.0019
-0.0005
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.4401
0.0000
0.0000
:
:
Iteration      7 | Cost: 1.171533e-01
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0021
-0.0020
-0.0024
-0.0005
:
:
E = 5000×1
0.0000
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.4283
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0019
-0.0019
-0.0022
-0.0005
:
:
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.4331
0.0000
0.0000
:
:
Iteration      8 | Cost: 1.074286e-01
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0025
-0.0020
-0.0022
-0.0005
:
:
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.5330
0.0000
0.0000
:
:
Iteration      9 | Cost: 9.531806e-02
theta = 401x1

```

```

0
0
0
-0.0000
0.0000
-0.0002
-0.0030
-0.0020
-0.0021
-0.0005
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.2810
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0026
-0.0020
-0.0022
-0.0005
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.4564
0.0000
0.0000
:
:
Iteration    10 | Cost: 9.301912e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0002
-0.0028
-0.0020
-0.0022
-0.0005

```

```

      :
      :
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.4812
0.0000
0.0000
      :
      :
theta = 401×1
      0
      0
      0
-0.0000
0.0001
-0.0002
-0.0033
-0.0020
-0.0021
-0.0005
      :
      :
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.5308
0.0000
0.0000
      :
      :
Iteration    11 | Cost: 8.418356e-02
theta = 401×1
      0
      0
      0
-0.0000
0.0001
-0.0002
-0.0035
-0.0020
-0.0020
-0.0005
      :
      :
E = 5000×1
0.0003
0.0000
0.0001
0.0003
0.0000
0.0006
0.0000
0.8039

```

```

0.0002
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0001
-0.0002
-0.0033
-0.0020
-0.0021
-0.0005
:
:
E = 5000x1
0.0001
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.6132
0.0000
0.0000
:
:
Iteration    12 | Cost: 8.186322e-02
theta = 401x1
0
0
0
-0.0000
0.0001
-0.0002
-0.0035
-0.0020
-0.0020
-0.0005
:
:
E = 5000x1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.5990
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0001
-0.0002

```

```

-0.0037
-0.0020
-0.0020
-0.0005
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.5823
0.0000
0.0000
:
:
Iteration    13 | Cost: 7.743126e-02
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0003
-0.0044
-0.0020
-0.0020
-0.0005
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.2463
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0002
-0.0038
-0.0020
-0.0020
-0.0005
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000

```



```

0.0000
0.0000
0.0000
0.5004
0.0000
0.0000
:
:
Iteration    14 | Cost: 7.645181e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0001
-0.0003
-0.0040
-0.0020
-0.0020
-0.0005
:
:
E = 5000x1
0.0001
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.4794
0.0000
0.0000
:
:
theta = 401x1
      0
      0
      0
-0.0000
0.0001
-0.0003
-0.0044
-0.0020
-0.0020
-0.0005
:
:
E = 5000x1
0.0001
0.0000
0.0001
0.0001
0.0000
0.0001
0.0000
0.4377
0.0000
0.0000
:
:
Iteration    15 | Cost: 7.209877e-02
theta = 401x1
      0

```

```

0
0
-0.0000
0.0001
-0.0003
-0.0041
-0.0020
-0.0021
-0.0005
:
:
E = 5000×1
0.0012
0.0001
0.0008
0.0014
0.0000
0.0028
0.0000
0.9283
0.0011
0.0001
:
:
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0003
-0.0044
-0.0020
-0.0020
-0.0005
:
:
E = 5000×1
0.0001
0.0000
0.0001
0.0001
0.0000
0.0001
0.0000
0.5076
0.0001
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0003
-0.0044
-0.0020
-0.0020
-0.0005
:
:
E = 5000×1

```

```

0.0001
0.0000
0.0001
0.0001
0.0000
0.0001
0.0000
0.4703
0.0001
0.0000
:
:
Iteration    16 | Cost: 7.195896e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0001
     -0.0003
     -0.0044
     -0.0020
     -0.0020
     -0.0005
      :
      :
E = 5000x1
      0.0001
      0.0000
      0.0001
      0.0001
      0.0000
      0.0001
      0.0000
      0.0000
      0.4813
      0.0001
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0001
     -0.0003
     -0.0045
     -0.0020
     -0.0020
     -0.0005
      :
      :
E = 5000x1
      0.0001
      0.0000
      0.0001
      0.0001
      0.0000
      0.0001
      0.0000
      0.5036
      0.0001
      0.0000

```

```

      :
      :
theta = 401×1
      0
      0
      0
     -0.0000
      0.0001
     -0.0003
     -0.0045
     -0.0020
     -0.0020
     -0.0005
      :
      :
E = 5000×1
      0.0001
      0.0000
      0.0001
      0.0001
      0.0000
      0.0001
      0.0000
      0.5442
      0.0001
      0.0000
      :
      :
Iteration    17 | Cost: 7.106302e-02
theta = 401×1
      0
      0
      0
     -0.0000
      0.0001
     -0.0003
     -0.0047
     -0.0021
     -0.0021
     -0.0005
      :
      :
E = 5000×1
      0.0004
      0.0000
      0.0002
      0.0004
      0.0000
      0.0005
      0.0000
      0.7159
      0.0002
      0.0000
      :
      :
theta = 401×1
      0
      0
      0
     -0.0000
      0.0001
     -0.0003
     -0.0046
     -0.0020

```

```

-0.0021
-0.0005
:
E = 5000×1
0.0002
0.0000
0.0001
0.0002
0.0000
0.0002
0.0000
0.5902
0.0001
0.0000
:
:
Iteration    18 | Cost: 7.081516e-02
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0003
-0.0047
-0.0021
-0.0021
-0.0005
:
:
E = 5000×1
0.0002
0.0000
0.0001
0.0002
0.0000
0.0002
0.0000
0.5930
0.0001
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0003
-0.0049
-0.0021
-0.0022
-0.0006
:
:
E = 5000×1
0.0003
0.0000
0.0001
0.0003
0.0000
0.0003

```

```

0.0000
0.5986
0.0001
0.0000
:
:
Iteration    19 | Cost: 6.984782e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0001
-0.0003
-0.0052
-0.0022
-0.0024
-0.0006
:
:
E = 5000x1
0.0003
0.0000
0.0001
0.0002
0.0000
0.0002
0.0000
0.5053
0.0001
0.0000
:
:
Iteration    20 | Cost: 6.908892e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0001
-0.0004
-0.0055
-0.0023
-0.0026
-0.0006
:
:
E = 5000x1
0.0004
0.0000
0.0002
0.0003
0.0000
0.0002
0.0000
0.4564
0.0001
0.0000
:
:
Iteration    21 | Cost: 6.818820e-02
theta = 401x1
      0
      0

```

```

0
-0.0000
0.0001
-0.0004
-0.0054
-0.0023
-0.0025
-0.0006
:
:
E = 5000×1
0.0007
0.0000
0.0003
0.0007
0.0000
0.0007
0.0000
0.6456
0.0004
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0004
-0.0055
-0.0023
-0.0026
-0.0006
:
:
E = 5000×1
0.0004
0.0000
0.0002
0.0004
0.0000
0.0003
0.0000
0.4947
0.0002
0.0000
:
:
Iteration    22 | Cost: 6.804182e-02
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0004
-0.0055
-0.0023
-0.0026
-0.0006
:
:
E = 5000×1

```

```

0.0004
0.0000
0.0002
0.0004
0.0000
0.0003
0.0000
0.5115
0.0002
0.0000
:
:
Iteration    23 | Cost: 6.788125e-02
theta = 401x1
      0
      0
      0
    -0.0000
     0.0001
    -0.0004
    -0.0056
    -0.0024
    -0.0026
    -0.0006
      :
      :
E = 5000x1
     0.0005
     0.0000
     0.0002
     0.0005
     0.0000
     0.0004
     0.0000
     0.5637
     0.0002
     0.0000
      :
      :
theta = 401x1
      0
      0
      0
    -0.0000
     0.0001
    -0.0004
    -0.0056
    -0.0024
    -0.0026
    -0.0006
      :
      :
E = 5000x1
     0.0005
     0.0000
     0.0002
     0.0004
     0.0000
     0.0004
     0.0000
     0.5444
     0.0002
     0.0000

```



```

      :
      :
Iteration    24 | Cost: 6.779397e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0001
     -0.0004
     -0.0056
     -0.0024
     -0.0027
     -0.0006
      :
      :
E = 5000x1
      0.0005
      0.0000
      0.0002
      0.0005
      0.0000
      0.0004
      0.0000
      0.5664
      0.0002
      0.0000
      :
      :
Iteration    25 | Cost: 6.767277e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0001
     -0.0004
     -0.0057
     -0.0024
     -0.0027
     -0.0006
      :
      :
E = 5000x1
      0.0005
      0.0000
      0.0002
      0.0004
      0.0000
      0.0003
      0.0000
      0.5397
      0.0002
      0.0000
      :
      :
Iteration    26 | Cost: 6.760372e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0001
     -0.0004

```

```

-0.0057
-0.0024
-0.0027
-0.0006
:
:
E = 5000×1
0.0004
0.0000
0.0002
0.0004
0.0000
0.0003
0.0000
0.5227
0.0002
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0004
-0.0058
-0.0025
-0.0028
-0.0006
:
:
E = 5000×1
0.0004
0.0000
0.0002
0.0004
0.0000
0.0002
0.0000
0.5012
0.0001
0.0000
:
:
Iteration    27 | Cost: 6.740638e-02
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0004
-0.0059
-0.0025
-0.0028
-0.0006
:
:
E = 5000×1
0.0005
0.0000
0.0003
0.0005

```

```

0.0000
0.0003
0.0000
0.5404
0.0002
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0001
-0.0004
-0.0058
-0.0025
-0.0028
-0.0006
:
:
E = 5000x1
0.0005
0.0000
0.0002
0.0004
0.0000
0.0003
0.0000
0.5189
0.0002
0.0000
:
:
Iteration    28 | Cost: 6.731728e-02
theta = 401x1
0
0
0
-0.0000
0.0001
-0.0004
-0.0059
-0.0025
-0.0028
-0.0006
:
:
E = 5000x1
0.0005
0.0000
0.0002
0.0005
0.0000
0.0003
0.0000
0.5277
0.0002
0.0000
:
:
theta = 401x1
0
0

```

```

      0
    -0.0000
      0.0001
    -0.0004
    -0.0060
    -0.0025
    -0.0029
    -0.0006
      :
      :
E = 5000×1
      0.0005
      0.0000
      0.0002
      0.0005
      0.0000
      0.0004
      0.0000
      0.5453
      0.0002
      0.0000
      :
      :
Iteration    29 | Cost: 6.698888e-02
theta = 401×1
      0
      0
      0
    -0.0000
      0.0001
    -0.0004
    -0.0062
    -0.0026
    -0.0030
    -0.0006
      :
      :
E = 5000×1
      0.0004
      0.0000
      0.0001
      0.0003
      0.0000
      0.0002
      0.0000
      0.4853
      0.0001
      0.0000
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
      0.0001
    -0.0004
    -0.0060
    -0.0026
    -0.0029
    -0.0006
      :
      :
E = 5000×1

```

```

0.0005
0.0000
0.0002
0.0005
0.0000
0.0003
0.0000
0.5315
0.0002
0.0000
:
:
Iteration    30 | Cost: 6.692984e-02
theta = 401x1
    0
    0
    0
-0.0000
 0.0001
-0.0004
-0.0061
-0.0026
-0.0030
-0.0006
:
:
E = 5000x1
 0.0005
 0.0000
 0.0002
 0.0005
 0.0000
 0.0003
 0.0000
 0.5286
 0.0002
 0.0000
:
:
theta = 401x1
    0
    0
    0
-0.0000
 0.0001
-0.0004
-0.0062
-0.0026
-0.0030
-0.0006
:
:
E = 5000x1
 0.0005
 0.0000
 0.0002
 0.0005
 0.0000
 0.0003
 0.0000
 0.5228
 0.0002
 0.0000

```

```

      :
      :
theta = 401×1
      0
      0
      0
     -0.0000
      0.0001
     -0.0004
     -0.0066
     -0.0028
     -0.0033
     -0.0006
      :
      :
E = 5000×1
      0.0005
      0.0000
      0.0002
      0.0005
      0.0000
      0.0002
      0.0000
      0.5052
      0.0002
      0.0000
      :
      :
Iteration    31 | Cost: 6.630404e-02
theta = 401×1
      0
      0
      0
     -0.0000
      0.0001
     -0.0005
     -0.0070
     -0.0030
     -0.0035
     -0.0007
      :
      :
E = 5000×1
      0.0007
      0.0001
      0.0004
      0.0008
      0.0000
      0.0004
      0.0000
      0.5627
      0.0003
      0.0000
      :
      :
theta = 401×1
      0
      0
      0
     -0.0000
      0.0001
     -0.0004
     -0.0068
     -0.0029

```

```

-0.0034
-0.0007
:
E = 5000×1
0.0006
0.0000
0.0003
0.0006
0.0000
0.0003
0.0000
0.5295
0.0002
0.0000
:
Iteration 32 | Cost: 6.606809e-02
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0005
-0.0069
-0.0030
-0.0035
-0.0007
:
E = 5000×1
0.0006
0.0000
0.0003
0.0006
0.0000
0.0003
0.0000
0.5382
0.0002
0.0000
:
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0005
-0.0073
-0.0031
-0.0038
-0.0007
:
E = 5000×1
0.0007
0.0001
0.0003
0.0008
0.0000
0.0004

```

```

0.0000
0.5553
0.0003
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0002
-0.0005
-0.0079
-0.0034
-0.0043
-0.0007
:
:
E = 5000x1
0.0010
0.0001
0.0004
0.0011
0.0000
0.0006
0.0000
0.5812
0.0005
0.0000
:
:
Iteration    33 | Cost: 6.466816e-02
theta = 401x1
0
0
0
-0.0000
0.0002
-0.0006
-0.0088
-0.0039
-0.0050
-0.0008
:
:
E = 5000x1
0.0006
0.0000
0.0002
0.0005
0.0000
0.0003
0.0000
0.4818
0.0002
0.0000
:
:
theta = 401x1
0
0
0
-0.0000

```



```

    0.0002
    -0.0005
    -0.0081
    -0.0036
    -0.0045
    -0.0007
    :
    :
E = 5000×1
    0.0008
    0.0001
    0.0003
    0.0009
    0.0000
    0.0005
    0.0000
    0.5515
    0.0004
    0.0000
    :
    :
Iteration    34 | Cost: 6.426962e-02
theta = 401×1
    0
    0
    0
    -0.0000
    0.0002
    -0.0006
    -0.0086
    -0.0038
    -0.0048
    -0.0008
    :
    :
E = 5000×1
    0.0008
    0.0001
    0.0003
    0.0008
    0.0000
    0.0004
    0.0000
    0.5263
    0.0003
    0.0000
    :
    :
theta = 401×1
    0
    0
    0
    -0.0000
    0.0002
    -0.0006
    -0.0094
    -0.0042
    -0.0054
    -0.0008
    :
    :
E = 5000×1
    0.0007
    0.0001

```

```

0.0003
0.0008
0.0000
0.0003
0.0000
0.4755
0.0003
0.0000
:
:
Iteration    35 | Cost: 6.267791e-02
theta = 401x1
0
0
0
-0.0000
0.0002
-0.0006
-0.0103
-0.0046
-0.0061
-0.0009
:
:
E = 5000x1
0.0019
0.0002
0.0014
0.0031
0.0000
0.0007
0.0000
0.6166
0.0013
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0002
-0.0006
-0.0095
-0.0042
-0.0055
-0.0008
:
:
E = 5000x1
0.0008
0.0001
0.0004
0.0009
0.0000
0.0003
0.0000
0.4923
0.0004
0.0000
:
:
Iteration    36 | Cost: 6.251576e-02

```

```

theta = 401x1
    0
    0
    0
-0.0000
 0.0002
-0.0006
-0.0097
-0.0043
-0.0057
-0.0008
    :
    :

```

```

E = 5000x1
 0.0008
 0.0001
 0.0004
 0.0010
 0.0000
 0.0003
 0.0000
 0.5094
 0.0004
 0.0000
    :
    :

```

```

theta = 401x1
    0
    0
    0
-0.0000
 0.0002
-0.0006
-0.0101
-0.0046
-0.0060
-0.0009
    :
    :

```

```

E = 5000x1
 0.0010
 0.0001
 0.0004
 0.0011
 0.0000
 0.0004
 0.0000
 0.5435
 0.0005
 0.0000
    :
    :

```

Iteration 37 | Cost: 6.202834e-02

```

theta = 401x1
    0
    0
    0
-0.0000
 0.0002
-0.0007
-0.0107
-0.0049
-0.0065
-0.0009

```

```

      :
      :
E = 5000×1
0.0007
0.0000
0.0002
0.0007
0.0000
0.0003
0.0000
0.5094
0.0003
0.0000
      :
      :

```

```

theta = 401×1
      0
      0
      0
-0.0000
0.0002
-0.0006
-0.0103
-0.0047
-0.0061
-0.0009
      :
      :

```

```

E = 5000×1
0.0008
0.0001
0.0004
0.0009
0.0000
0.0004
0.0000
0.5321
0.0004
0.0000
      :
      :

```

Iteration 38 | Cost: 6.188522e-02

```

theta = 401×1
      0
      0
      0
-0.0000
0.0002
-0.0007
-0.0106
-0.0048
-0.0064
-0.0009
      :
      :

```

```

E = 5000×1
0.0008
0.0001
0.0003
0.0008
0.0000
0.0004
0.0000
0.5273

```

```

0.0004
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0002
-0.0007
-0.0112
-0.0052
-0.0069
-0.0010
:
:
E = 5000x1
0.0007
0.0001
0.0003
0.0007
0.0000
0.0003
0.0000
0.5178
0.0003
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0003
-0.0008
-0.0130
-0.0062
-0.0084
-0.0011
:
:
E = 5000x1
0.0004
0.0000
0.0002
0.0004
0.0000
0.0002
0.0000
0.4893
0.0002
0.0000
:
:
Iteration    39 | Cost: 6.013896e-02
theta = 401x1
0
0
0
-0.0000
0.0003
-0.0009

```

```

-0.0146
-0.0072
-0.0098
-0.0013
:
:
E = 5000×1
0.0005
0.0000
0.0003
0.0006
0.0000
0.0003
0.0000
0.5441
0.0003
0.0000
:
:
Iteration    40 | Cost: 5.937078e-02
theta = 401×1
0
0
0
-0.0000
0.0003
-0.0009
-0.0146
-0.0072
-0.0098
-0.0013
:
:
E = 5000×1
0.0002
0.0000
0.0001
0.0002
0.0000
0.0001
0.0000
0.4370
0.0001
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0003
-0.0009
-0.0146
-0.0072
-0.0098
-0.0013
:
:
E = 5000×1
0.0004
0.0000
0.0002
0.0004

```

```

0.0000
0.0002
0.0000
0.5039
0.0002
0.0000
:
:
Iteration    41 | Cost: 5.888593e-02
theta = 401x1
0
0
0
-0.0000
0.0003
-0.0009
-0.0147
-0.0073
-0.0101
-0.0013
:
:
E = 5000x1
0.0004
0.0000
0.0003
0.0005
0.0000
0.0002
0.0000
0.4616
0.0003
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0003
-0.0009
-0.0146
-0.0072
-0.0100
-0.0013
:
:
E = 5000x1
0.0004
0.0000
0.0002
0.0004
0.0000
0.0002
0.0000
0.4822
0.0003
0.0000
:
:
Iteration    42 | Cost: 5.862828e-02
theta = 401x1
0

```

```

0
0
-0.0000
0.0003
-0.0009
-0.0148
-0.0074
-0.0103
-0.0013
:
:
E = 5000×1
0.0004
0.0000
0.0004
0.0007
0.0000
0.0002
0.0000
0.4704
0.0003
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0003
-0.0009
-0.0147
-0.0073
-0.0101
-0.0013
:
:
E = 5000×1
0.0004
0.0000
0.0003
0.0005
0.0000
0.0002
0.0000
0.4786
0.0003
0.0000
:
:
Iteration    43 | Cost: 5.854428e-02
theta = 401×1
0
0
0
-0.0000
0.0003
-0.0009
-0.0148
-0.0074
-0.0102
-0.0013
:
:

```



```

E = 5000×1
  0.0003
  0.0000
  0.0003
  0.0005
  0.0000
  0.0002
  0.0000
  0.4556
  0.0002
  0.0000
  ⋮
Iteration    44 | Cost: 5.847598e-02
theta = 401×1
    0
    0
    0
 -0.0000
  0.0003
 -0.0009
 -0.0149
 -0.0076
 -0.0106
 -0.0013
    ⋮
    ⋮
E = 5000×1
  0.0004
  0.0000
  0.0003
  0.0006
  0.0000
  0.0002
  0.0000
  0.4575
  0.0003
  0.0000
  ⋮
  ⋮
Iteration    45 | Cost: 5.840091e-02
theta = 401×1
    0
    0
    0
 -0.0000
  0.0003
 -0.0009
 -0.0150
 -0.0077
 -0.0107
 -0.0013
    ⋮
    ⋮
E = 5000×1
  0.0004
  0.0000
  0.0003
  0.0006
  0.0000
  0.0002
  0.0000
  0.4665
  0.0003

```

```

0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0004
-0.0009
-0.0152
-0.0079
-0.0111
-0.0014
:
:
E = 5000x1
0.0004
0.0000
0.0004
0.0006
0.0000
0.0002
0.0000
0.4846
0.0003
0.0000
:
:
Iteration    46 | Cost: 5.812346e-02
theta = 401x1
0
0
0
-0.0000
0.0004
-0.0009
-0.0155
-0.0082
-0.0116
-0.0014
:
:
E = 5000x1
0.0006
0.0000
0.0006
0.0009
0.0000
0.0004
0.0000
0.5545
0.0006
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0004
-0.0009
-0.0153

```

```

-0.0080
-0.0113
-0.0014
:
:
E = 5000×1
0.0004
0.0000
0.0004
0.0007
0.0000
0.0003
0.0000
0.5105
0.0004
0.0000
:
:
Iteration 47 | Cost: 5.803256e-02
theta = 401×1
0
0
0
-0.0000
0.0004
-0.0009
-0.0155
-0.0082
-0.0116
-0.0014
:
:
E = 5000×1
0.0005
0.0000
0.0004
0.0007
0.0000
0.0003
0.0000
0.5247
0.0004
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0004
-0.0009
-0.0159
-0.0085
-0.0122
-0.0015
:
:
E = 5000×1
0.0005
0.0000
0.0004
0.0007
0.0000

```

```

0.0004
0.0000
0.5529
0.0004
0.0000
:
:
Iteration    48 | Cost: 5.773512e-02
theta = 401x1
      0
      0
      0
    -0.0000
     0.0004
    -0.0009
    -0.0161
    -0.0089
    -0.0127
    -0.0015
      :
      :
E = 5000x1
     0.0003
     0.0000
     0.0003
     0.0004
     0.0000
     0.0003
     0.0000
     0.5039
     0.0002
     0.0000
      :
      :
theta = 401x1
      0
      0
      0
    -0.0000
     0.0004
    -0.0009
    -0.0160
    -0.0087
    -0.0124
    -0.0015
      :
      :
E = 5000x1
     0.0004
     0.0000
     0.0003
     0.0006
     0.0000
     0.0004
     0.0000
     0.5334
     0.0003
     0.0000
      :
      :
Iteration    49 | Cost: 5.763074e-02
theta = 401x1
      0
      0

```

```

0
-0.0000
0.0004
-0.0009
-0.0161
-0.0088
-0.0127
-0.0015
:
:
E = 5000×1
0.0004
0.0000
0.0003
0.0005
0.0000
0.0004
0.0000
0.5219
0.0003
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0004
-0.0009
-0.0164
-0.0091
-0.0132
-0.0016
:
:
E = 5000×1
0.0004
0.0000
0.0003
0.0005
0.0000
0.0003
0.0000
0.4989
0.0002
0.0000
:
:
Iteration    50 | Cost: 5.725252e-02
theta = 401×1
0
0
0
0
0
0
0
0
0
0
:
:
E = 5000×1

```

```

0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
:
:
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0000
-0.0000
-0.0000
-0.0000
:
:
E = 5000x1
 0.1041
 0.0890
 0.0590
 0.0609
 0.0659
 0.0773
 0.0551
 0.2576
 0.0486
 0.0882
:
:
Iteration      1 | Cost: 3.456557e-01
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
 0.0001
-0.0004
-0.0004
-0.0002
:
:
E = 5000x1
 0.1306
 0.1622
 0.1337
 0.0419
 0.5874
 0.0127
 0.6222
 0.8894
 0.6874

```

```

0.9574
:
:
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
0.0000
-0.0002
-0.0002
-0.0001
:
:
E = 5000x1
0.1157
0.1183
0.0869
0.0513
0.2210
0.0340
0.2151
0.5981
0.2258
0.5469
:
:
Iteration      2 | Cost: 2.179164e-01
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
0.0001
-0.0004
-0.0004
-0.0002
:
:
E = 5000x1
0.0011
0.0009
0.0004
0.0001
0.0016
0.0001
0.0016
0.2136
0.0013
0.0395
:
:
Iteration      3 | Cost: 1.784174e-01
theta = 401x1
0
0
0
-0.0000

```

```

0.0000
0.0003
0.0014
-0.0024
-0.0026
-0.0009
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.1468
0.0000
0.6645
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0002
0.0008
-0.0014
-0.0015
-0.0006
:
:
E = 5000×1
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.1778
0.0000
0.2220
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0001
0.0003
-0.0008
-0.0008
-0.0003
:
:
E = 5000×1
0.0001
0.0000

```



```

0.0000
0.0000
0.0002
0.0000
0.0004
0.2000
0.0003
0.0767
:
:
Iteration      4 | Cost: 1.678808e-01
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
    0.0000
    0.0001
    0.0005
   -0.0007
   -0.0007
   -0.0003
      :
      :
E = 5000x1
    0.0014
    0.0015
    0.0031
    0.0004
    0.0041
    0.0000
    0.0213
    0.3338
    0.0096
    0.5372
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
    0.0000
    0.0001
    0.0005
   -0.0007
   -0.0008
   -0.0003
      :
      :
E = 5000x1
    0.0005
    0.0005
    0.0008
    0.0001
    0.0016
    0.0000
    0.0066
    0.2891
    0.0033
    0.3448

```

```

      :
      :
Iteration      5 | Cost: 1.427129e-01
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000
      0.0001
      0.0007
     -0.0007
     -0.0007
     -0.0002
      :
      :
E = 5000x1
      0.0012
      0.0014
      0.0038
      0.0006
      0.0018
      0.0000
      0.0162
      0.1564
      0.0041
      0.3468
      :
      :
Iteration      6 | Cost: 1.150393e-01
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000
      0.0001
      0.0008
     -0.0007
     -0.0007
     -0.0002
      :
      :
E = 5000x1
      0.0002
      0.0002
      0.0003
      0.0001
      0.0002
      0.0000
      0.0013
      0.0468
      0.0002
      0.0484
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000

```

```

-0.0000
 0.0001
 0.0007
-0.0007
-0.0007
-0.0002
  ⋮
  ⋮
E = 5000×1
 0.0005
 0.0006
 0.0014
 0.0002
 0.0007
 0.0000
 0.0057
 0.0958
 0.0012
 0.1653
  ⋮
  ⋮
Iteration      7 | Cost: 1.063718e-01
theta = 401×1
 0
 0
 0
-0.0000
-0.0000
 0.0002
 0.0014
-0.0010
-0.0009
-0.0003
  ⋮
  ⋮
E = 5000×1
 0.0007
 0.0010
 0.0020
 0.0005
 0.0019
 0.0000
 0.0169
 0.0687
 0.0032
 0.2587
  ⋮
  ⋮
Iteration      8 | Cost: 9.707803e-02
theta = 401×1
 0
 0
 0
-0.0000
-0.0000
 0.0004
 0.0018
-0.0021
-0.0014
-0.0005
  ⋮
  ⋮
E = 5000×1
 0.0072

```

```

0.0225
0.0247
0.0101
0.0426
0.0002
0.4215
0.1746
0.0939
0.8987
:
:
theta = 401x1
    0
    0
    0
-0.0000
-0.0000
0.0002
0.0014
-0.0012
-0.0010
-0.0003
:
:
E = 5000x1
    0.0010
    0.0018
    0.0032
    0.0009
    0.0034
    0.0000
    0.0334
    0.0823
    0.0061
    0.3896
:
:
Iteration      9 | Cost: 9.518367e-02
theta = 401x1
    0
    0
    0
-0.0000
-0.0000
0.0003
0.0015
-0.0014
-0.0011
-0.0004
:
:
E = 5000x1
    0.0010
    0.0020
    0.0029
    0.0009
    0.0034
    0.0000
    0.0362
    0.0781
    0.0061
    0.4060
:
:

```

```

theta = 401x1
    0
    0
    0
-0.0000
-0.0000
 0.0003
 0.0016
-0.0018
-0.0013
-0.0004
  ⋮
E = 5000x1
 0.0011
 0.0024
 0.0023
 0.0009
 0.0035
 0.0000
 0.0424
 0.0703
 0.0059
 0.4394
  ⋮
Iteration    10 | Cost: 9.035733e-02
theta = 401x1
    0
    0
    0
-0.0000
-0.0000
 0.0005
 0.0023
-0.0035
-0.0021
-0.0007
  ⋮
E = 5000x1
 0.0047
 0.0207
 0.0109
 0.0053
 0.0229
 0.0001
 0.4360
 0.0870
 0.0591
 0.8940
  ⋮
theta = 401x1
    0
    0
    0
-0.0000
-0.0000
 0.0004
 0.0018
-0.0021
-0.0015
-0.0005

```

```

      :
      :
E = 5000×1
    0.0014
    0.0037
    0.0032
    0.0013
    0.0051
    0.0000
    0.0724
    0.0734
    0.0094
    0.5565
      :
      :
Iteration    11 | Cost: 8.928846e-02
theta = 401×1
        0
        0
        0
    -0.0000
    -0.0000
    0.0004
    0.0019
    -0.0025
    -0.0016
    -0.0006
      :
      :
E = 5000×1
    0.0012
    0.0034
    0.0027
    0.0010
    0.0042
    0.0000
    0.0737
    0.0572
    0.0086
    0.5463
      :
      :
theta = 401×1
        0
        0
        0
    -0.0000
    -0.0000
    0.0005
    0.0022
    -0.0031
    -0.0019
    -0.0007
      :
      :
E = 5000×1
    0.0009
    0.0027
    0.0020
    0.0007
    0.0029
    0.0000
    0.0762
    0.0344

```

```

0.0072
0.5258
:
Iteration    12 | Cost: 8.531186e-02
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0006
0.0025
-0.0038
-0.0023
-0.0009
:
:
E = 5000x1
0.0010
0.0036
0.0033
0.0009
0.0040
0.0000
0.1633
0.0251
0.0148
0.6671
:
:
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0006
0.0024
-0.0036
-0.0022
-0.0008
:
:
E = 5000x1
0.0009
0.0032
0.0028
0.0008
0.0036
0.0000
0.1250
0.0281
0.0114
0.6179
:
:
Iteration    13 | Cost: 8.333526e-02
theta = 401x1
0
0
0
-0.0000
-0.0000

```

```

0.0007
0.0028
-0.0043
-0.0026
-0.0010
:
:
E = 5000×1
0.0005
0.0021
0.0022
0.0004
0.0023
0.0000
0.1286
0.0138
0.0101
0.5828
:
:
Iteration    14 | Cost: 8.052683e-02
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0007
0.0028
-0.0044
-0.0026
-0.0010
:
:
E = 5000×1
0.0003
0.0011
0.0010
0.0002
0.0011
0.0000
0.0651
0.0094
0.0046
0.4180
:
:
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0007
0.0028
-0.0044
-0.0026
-0.0010
:
:
E = 5000×1
0.0004
0.0014
0.0014

```



```

0.0003
0.0015
0.0000
0.0849
0.0109
0.0062
0.4807
:
:
Iteration    15 | Cost: 7.932857e-02
theta = 401x1
      0
      0
      0
-0.0000
-0.0000
0.0007
0.0029
-0.0045
-0.0027
-0.0010
:
:
E = 5000x1
0.0003
0.0010
0.0013
0.0002
0.0014
0.0000
0.0736
0.0096
0.0062
0.4591
:
:
theta = 401x1
      0
      0
      0
-0.0000
-0.0000
0.0007
0.0030
-0.0047
-0.0028
-0.0011
:
:
E = 5000x1
0.0003
0.0008
0.0012
0.0002
0.0013
0.0000
0.0623
0.0084
0.0062
0.4343
:
:
Iteration    16 | Cost: 7.672637e-02
theta = 401x1

```

```

0
0
0
-0.0000
-0.0000
0.0008
0.0034
-0.0056
-0.0032
-0.0013
:
:
E = 5000×1
0.0002
0.0006
0.0014
0.0003
0.0005
0.0000
0.0281
0.0130
0.0039
0.4063
:
:
Iteration    17 | Cost: 7.530942e-02
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0011
0.0040
-0.0075
-0.0040
-0.0017
:
:
E = 5000×1
0.0000
0.0001
0.0002
0.0000
0.0000
0.0000
0.0007
0.0093
0.0001
0.0681
:
:
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0009
0.0035
-0.0059
-0.0033
-0.0014

```

```

      :
      :
E = 5000×1
    0.0002
    0.0004
    0.0011
    0.0002
    0.0003
    0.0000
    0.0167
    0.0124
    0.0024
    0.3310
      :
      :
Iteration    18 | Cost: 7.500108e-02
theta = 401×1
        0
        0
        0
    -0.0000
    -0.0000
    0.0009
    0.0034
    -0.0058
    -0.0033
    -0.0013
      :
      :
E = 5000×1
    0.0001
    0.0004
    0.0009
    0.0002
    0.0003
    0.0000
    0.0169
    0.0107
    0.0022
    0.3110
      :
      :
Iteration    19 | Cost: 7.445295e-02
theta = 401×1
        0
        0
        0
    -0.0000
    -0.0000
    0.0009
    0.0034
    -0.0059
    -0.0033
    -0.0013
      :
      :
E = 5000×1
    0.0002
    0.0004
    0.0011
    0.0002
    0.0004
    0.0000
    0.0225

```

```

0.0099
0.0028
0.3433
:
:
Iteration    20 | Cost: 7.391453e-02
theta = 401x1
      0
      0
      0
    -0.0000
    -0.0000
     0.0009
     0.0034
    -0.0059
    -0.0033
    -0.0014
      :
      :
E = 5000x1
    0.0001
    0.0003
    0.0009
    0.0001
    0.0003
    0.0000
    0.0209
    0.0080
    0.0023
    0.3060
      :
      :
Iteration    21 | Cost: 7.349869e-02
theta = 401x1
      0
      0
      0
    -0.0000
    -0.0000
     0.0009
     0.0035
    -0.0061
    -0.0033
    -0.0014
      :
      :
E = 5000x1
    0.0001
    0.0004
    0.0010
    0.0001
    0.0004
    0.0000
    0.0300
    0.0064
    0.0028
    0.3318
      :
      :
Iteration    22 | Cost: 7.307295e-02
theta = 401x1
      0
      0
      0

```

```

-0.0000
-0.0000
0.0009
0.0035
-0.0062
-0.0034
-0.0014
:
:
E = 5000×1
0.0002
0.0006
0.0019
0.0003
0.0007
0.0000
0.0534
0.0085
0.0050
0.4663
:
:
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0009
0.0035
-0.0061
-0.0033
-0.0014
:
:
E = 5000×1
0.0002
0.0004
0.0012
0.0002
0.0005
0.0000
0.0350
0.0069
0.0033
0.3659
:
:
Iteration    23 | Cost: 7.296937e-02
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0009
0.0035
-0.0062
-0.0034
-0.0014
:
:
E = 5000×1
0.0002

```

```

0.0004
0.0012
0.0002
0.0005
0.0000
0.0358
0.0070
0.0032
0.3730
:
:
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0009
0.0035
-0.0063
-0.0034
-0.0014
:
:
E = 5000x1
0.0002
0.0005
0.0013
0.0002
0.0005
0.0000
0.0374
0.0072
0.0032
0.3873
:
:
Iteration    24 | Cost: 7.262398e-02
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0010
0.0036
-0.0067
-0.0035
-0.0014
:
:
E = 5000x1
0.0002
0.0005
0.0014
0.0002
0.0005
0.0000
0.0417
0.0064
0.0034
0.3895
:
:

```

```

theta = 401x1
    0
    0
    0
-0.0000
-0.0000
 0.0010
 0.0038
-0.0074
-0.0037
-0.0015
  ⋮
E = 5000x1
 0.0002
 0.0005
 0.0015
 0.0002
 0.0005
 0.0000
 0.0519
 0.0050
 0.0039
 0.3938
  ⋮
Iteration    25 | Cost: 7.129794e-02
theta = 401x1
    0
    0
    0
-0.0000
-0.0000
 0.0012
 0.0042
-0.0084
-0.0041
-0.0016
  ⋮
E = 5000x1
 0.0001
 0.0002
 0.0006
 0.0001
 0.0002
 0.0000
 0.0252
 0.0024
 0.0015
 0.2335
  ⋮
theta = 401x1
    0
    0
    0
-0.0000
-0.0000
 0.0011
 0.0038
-0.0075
-0.0038
-0.0015

```

```

      :
      :
E = 5000×1
    0.0002
    0.0004
    0.0014
    0.0002
    0.0005
    0.0000
    0.0472
    0.0046
    0.0034
    0.3700
      :
      :
Iteration    26 | Cost: 7.118480e-02
theta = 401×1
        0
        0
        0
    -0.0000
    -0.0000
    0.0011
    0.0039
    -0.0077
    -0.0039
    -0.0015
      :
      :
E = 5000×1
    0.0002
    0.0004
    0.0013
    0.0002
    0.0004
    0.0000
    0.0477
    0.0041
    0.0033
    0.3679
      :
      :
theta = 401×1
        0
        0
        0
    -0.0000
    -0.0000
    0.0012
    0.0041
    -0.0081
    -0.0040
    -0.0016
      :
      :
E = 5000×1
    0.0002
    0.0004
    0.0013
    0.0002
    0.0004
    0.0000
    0.0485
    0.0036

```



```

0.0032
0.3649
:
Iteration    27 | Cost: 7.089717e-02
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0012
0.0042
-0.0084
-0.0041
-0.0016
:
:
E = 5000x1
0.0002
0.0004
0.0015
0.0002
0.0005
0.0000
0.0579
0.0034
0.0037
0.3972
:
:
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0013
0.0045
-0.0091
-0.0043
-0.0016
:
:
E = 5000x1
0.0002
0.0005
0.0019
0.0003
0.0006
0.0000
0.0818
0.0030
0.0049
0.4642
:
:
Iteration    28 | Cost: 6.963444e-02
theta = 401x1
0
0
0
-0.0000
-0.0000

```

```

0.0010
0.0036
-0.0066
-0.0035
-0.0014
:
:
E = 5000×1
0.0003
0.0008
0.0040
0.0004
0.0008
0.0000
0.0925
0.0113
0.0091
0.5265
:
:
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0013
0.0044
-0.0089
-0.0042
-0.0016
:
:
E = 5000×1
0.0002
0.0005
0.0020
0.0003
0.0006
0.0000
0.0829
0.0034
0.0052
0.4704
:
:
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0013
0.0045
-0.0090
-0.0043
-0.0016
:
:
E = 5000×1
0.0002
0.0005
0.0019
0.0003

```

```

0.0006
0.0000
0.0823
0.0031
0.0050
0.4668
:
:
Iteration      29 | Cost: 6.959800e-02
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0013
0.0045
-0.0091
-0.0043
-0.0016
:
:
E = 5000x1
0.0002
0.0005
0.0019
0.0003
0.0006
0.0000
0.0816
0.0031
0.0050
0.4636
:
:
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0013
0.0046
-0.0091
-0.0043
-0.0016
:
:
E = 5000x1
0.0002
0.0005
0.0019
0.0003
0.0005
0.0000
0.0802
0.0031
0.0049
0.4574
:
:
theta = 401x1
0
0

```

```

      0
    -0.0000
    -0.0000
     0.0013
     0.0047
    -0.0093
    -0.0044
    -0.0016
     :
     :
E = 5000×1
     0.0002
     0.0004
     0.0019
     0.0003
     0.0005
     0.0000
     0.0763
     0.0030
     0.0045
     0.4388
     :
     :
Iteration    30 | Cost: 6.916223e-02
theta = 401×1
      0
      0
      0
    -0.0000
    -0.0000
     0.0014
     0.0049
    -0.0096
    -0.0044
    -0.0017
     :
     :
E = 5000×1
     0.0001
     0.0003
     0.0013
     0.0002
     0.0003
     0.0000
     0.0503
     0.0025
     0.0028
     0.3386
     :
     :
Iteration    31 | Cost: 6.893774e-02
theta = 401×1
      0
      0
      0
    -0.0000
    -0.0000
     0.0017
     0.0063
    -0.0116
    -0.0051
    -0.0017
     :
     :

```

```

E = 5000×1
0.0000
0.0000
0.0002
0.0000
0.0000
0.0000
0.0000
0.0074
0.0011
0.0003
0.0673
⋮

```

```

theta = 401×1
0
0
0
-0.0000
-0.0000
0.0014
0.0050
-0.0098
-0.0045
-0.0017
⋮

```

```

E = 5000×1
0.0001
0.0002
0.0011
0.0002
0.0002
0.0000
0.0417
0.0023
0.0022
0.2962
⋮

```

```

theta = 401×1
0
0
0
-0.0000
-0.0000
0.0014
0.0050
-0.0097
-0.0045
-0.0017
⋮

```

```

E = 5000×1
0.0001
0.0002
0.0011
0.0002
0.0002
0.0000
0.0451
0.0024
0.0024
0.3137

```

```

      :
      :
Iteration    32 | Cost: 6.891908e-02
theta = 401x1
      0
      0
      0
     -0.0000
     -0.0000
      0.0014
      0.0050
     -0.0097
     -0.0045
     -0.0017
      :
      :
E = 5000x1
      0.0001
      0.0002
      0.0011
      0.0002
      0.0002
      0.0000
      0.0458
      0.0024
      0.0025
      0.3164
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
     -0.0000
      0.0014
      0.0050
     -0.0097
     -0.0045
     -0.0017
      :
      :
E = 5000x1
      0.0001
      0.0002
      0.0012
      0.0002
      0.0002
      0.0000
      0.0471
      0.0024
      0.0025
      0.3218
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
     -0.0000
      0.0014
      0.0050
     -0.0098

```

```

-0.0045
-0.0017
:
E = 5000×1
0.0001
0.0003
0.0013
0.0002
0.0002
0.0000
0.0513
0.0025
0.0028
0.3383
:
Iteration 33 | Cost: 6.872534e-02
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0014
0.0051
-0.0099
-0.0045
-0.0017
:
E = 5000×1
0.0002
0.0003
0.0014
0.0002
0.0003
0.0000
0.0629
0.0027
0.0033
0.3875
:
Iteration 34 | Cost: 6.853559e-02
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0015
0.0055
-0.0102
-0.0046
-0.0017
:
E = 5000×1
0.0001
0.0002
0.0009
0.0002
0.0002

```

```

0.0000
0.0474
0.0022
0.0021
0.3188
:
:
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0015
0.0052
-0.0100
-0.0045
-0.0017
:
:
E = 5000x1
0.0002
0.0003
0.0013
0.0002
0.0003
0.0000
0.0586
0.0026
0.0030
0.3699
:
:
Iteration    35 | Cost: 6.849484e-02
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0015
0.0053
-0.0101
-0.0046
-0.0017
:
:
E = 5000x1
0.0002
0.0003
0.0012
0.0002
0.0003
0.0000
0.0590
0.0025
0.0029
0.3681
:
:
theta = 401x1
0
0
0

```



```

-0.0000
-0.0000
0.0015
0.0055
-0.0103
-0.0046
-0.0017
:
:
E = 5000×1
0.0001
0.0003
0.0012
0.0002
0.0003
0.0000
0.0596
0.0024
0.0026
0.3646
:
:
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0017
0.0062
-0.0109
-0.0048
-0.0016
:
:
E = 5000×1
0.0001
0.0002
0.0010
0.0002
0.0003
0.0000
0.0617
0.0021
0.0021
0.3539
:
:
theta = 401×1
0
0
0
-0.0000
-0.0001
0.0020
0.0078
-0.0125
-0.0051
-0.0016
:
:
E = 5000×1
0.0001
0.0002

```

```

0.0007
0.0001
0.0003
0.0000
0.0672
0.0015
0.0012
0.3284
:
:
Iteration    36 | Cost: 6.754959e-02
theta = 401x1
      0
      0
      0
-0.0000
-0.0001
 0.0024
 0.0096
-0.0142
-0.0055
-0.0015
:
:
E = 5000x1
 0.0001
 0.0002
 0.0010
 0.0002
 0.0005
 0.0000
 0.1416
 0.0015
 0.0016
 0.4534
:
:
theta = 401x1
      0
      0
      0
-0.0000
-0.0001
 0.0021
 0.0085
-0.0131
-0.0053
-0.0016
:
:
E = 5000x1
 0.0001
 0.0002
 0.0008
 0.0001
 0.0003
 0.0000
 0.0907
 0.0015
 0.0013
 0.3757
:
:
Iteration    37 | Cost: 6.715662e-02

```

theta = 401x1

0
0
0

-0.0000
-0.0001
0.0023
0.0091
-0.0139
-0.0054
-0.0015

⋮

E = 5000x1

0.0001
0.0002
0.0007
0.0001
0.0003
0.0000
0.0864
0.0015
0.0012
0.3548

⋮

theta = 401x1

0
0
0

-0.0000
-0.0001
0.0026
0.0104
-0.0154
-0.0057
-0.0014

⋮

E = 5000x1

0.0001
0.0001
0.0004
0.0001
0.0002
0.0000
0.0782
0.0015
0.0010
0.3147

⋮

Iteration 38 | Cost: 6.583029e-02

theta = 401x1

0
0
0

-0.0000
-0.0001
0.0029
0.0119
-0.0174
-0.0061
-0.0013

```

      :
      :
E = 5000×1
  0.0000
  0.0000
  0.0001
  0.0000
  0.0000
  0.0000
  0.0117
  0.0005
  0.0001
  0.0721
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
    -0.0001
     0.0026
     0.0106
    -0.0156
    -0.0058
    -0.0014
      :
      :
E = 5000×1
  0.0000
  0.0001
  0.0004
  0.0001
  0.0002
  0.0000
  0.0652
  0.0013
  0.0008
  0.2777
      :
      :
Iteration    39 | Cost: 6.574359e-02
theta = 401×1
      0
      0
      0
    -0.0000
    -0.0001
     0.0027
     0.0109
    -0.0160
    -0.0059
    -0.0014
      :
      :
E = 5000×1
  0.0000
  0.0001
  0.0003
  0.0001
  0.0001
  0.0000
  0.0571
  0.0011

```

```

0.0007
0.2522
:
Iteration    40 | Cost: 6.557710e-02
theta = 401x1
    0
    0
    0
-0.0000
-0.0001
0.0027
0.0110
-0.0161
-0.0059
-0.0014
:
:
E = 5000x1
0.0000
0.0001
0.0004
0.0001
0.0001
0.0000
0.0612
0.0011
0.0008
0.2641
:
:
theta = 401x1
    0
    0
    0
-0.0000
-0.0001
0.0027
0.0112
-0.0164
-0.0059
-0.0014
:
:
E = 5000x1
0.0000
0.0001
0.0005
0.0001
0.0001
0.0000
0.0702
0.0012
0.0009
0.2891
:
:
Iteration    41 | Cost: 6.517627e-02
theta = 401x1
    0
    0
    0
-0.0000
-0.0001

```

```

0.0029
0.0118
-0.0174
-0.0061
-0.0013
:
:
E = 5000×1
0.0000
0.0001
0.0005
0.0001
0.0001
0.0000
0.0689
0.0008
0.0010
0.2863
:
:
Iteration    42 | Cost: 6.467724e-02
theta = 401×1
0
0
0
-0.0000
-0.0001
0.0031
0.0126
-0.0185
-0.0062
-0.0011
:
:
E = 5000×1
0.0001
0.0001
0.0010
0.0001
0.0002
0.0000
0.1175
0.0008
0.0025
0.4090
:
:
theta = 401×1
0
0
0
-0.0000
-0.0001
0.0030
0.0121
-0.0178
-0.0061
-0.0012
:
:
E = 5000×1
0.0001
0.0001
0.0007

```

```

0.0001
0.0001
0.0000
0.0841
0.0008
0.0014
0.3289
:
:
Iteration    43 | Cost: 6.454394e-02
theta = 401x1
      0
      0
      0
-0.0000
-0.0001
 0.0031
 0.0126
-0.0185
-0.0062
-0.0011
  :
  :
E = 5000x1
0.0001
0.0001
0.0008
0.0001
0.0001
0.0000
0.0964
0.0008
0.0020
0.3629
  :
  :
Iteration    44 | Cost: 6.439888e-02
theta = 401x1
      0
      0
      0
-0.0000
-0.0001
 0.0031
 0.0127
-0.0187
-0.0062
-0.0011
  :
  :
E = 5000x1
0.0001
0.0001
0.0007
0.0001
0.0001
0.0000
0.0831
0.0007
0.0017
0.3315
  :
  :
Iteration    45 | Cost: 6.429680e-02

```

theta = 401x1

0
0
0
-0.0000
-0.0001
0.0034
0.0136
-0.0198
-0.0063
-0.0010
:
:

E = 5000x1

0.0000
0.0001
0.0006
0.0001
0.0001
0.0000
0.0657
0.0006
0.0014
0.2875
:
:

theta = 401x1

0
0
0
-0.0000
-0.0001
0.0033
0.0131
-0.0192
-0.0063
-0.0011
:
:

E = 5000x1

0.0000
0.0001
0.0007
0.0001
0.0001
0.0000
0.0741
0.0007
0.0015
0.3095
:
:

Iteration 46 | Cost: 6.423415e-02

theta = 401x1

0
0
0
-0.0000
-0.0001
0.0033
0.0133
-0.0194
-0.0063
-0.0010


```

      :
      :
E = 5000×1
    0.0001
    0.0001
    0.0007
    0.0001
    0.0001
    0.0000
    0.0778
    0.0007
    0.0016
    0.3199
      :
      :
theta = 401×1
        0
        0
        0
    -0.0000
    -0.0001
    0.0033
    0.0135
    -0.0198
    -0.0063
    -0.0010
      :
      :
E = 5000×1
    0.0001
    0.0001
    0.0008
    0.0001
    0.0001
    0.0000
    0.0854
    0.0007
    0.0018
    0.3406
      :
      :
Iteration    47 | Cost: 6.404661e-02
theta = 401×1
        0
        0
        0
    -0.0000
    -0.0001
    0.0037
    0.0149
    -0.0215
    -0.0064
    -0.0008
      :
      :
E = 5000×1
    0.0001
    0.0001
    0.0008
    0.0001
    0.0001
    0.0000
    0.0738
    0.0006

```

```

0.0015
0.3150
:
Iteration    48 | Cost: 6.384516e-02
theta = 401x1
0
0
0
-0.0000
-0.0001
0.0039
0.0160
-0.0229
-0.0066
-0.0006
:
:
E = 5000x1
0.0001
0.0001
0.0007
0.0001
0.0001
0.0000
0.0768
0.0006
0.0015
0.3288
:
:
theta = 401x1
0
0
0
-0.0000
-0.0002
0.0045
0.0183
-0.0257
-0.0068
-0.0002
:
:
E = 5000x1
0.0001
0.0001
0.0007
0.0001
0.0001
0.0000
0.0832
0.0006
0.0015
0.3573
:
:
Iteration    49 | Cost: 6.316550e-02
theta = 401x1
0
0
0
-0.0000
-0.0002

```

```

0.0052
0.0214
-0.0293
-0.0071
0.0003
:
:
E = 5000×1
0.0001
0.0001
0.0014
0.0002
0.0002
0.0000
0.1768
0.0008
0.0033
0.5507
:
:
theta = 401×1
0
0
0
-0.0000
-0.0002
0.0046
0.0188
-0.0262
-0.0068
-0.0001
:
:
E = 5000×1
0.0001
0.0001
0.0007
0.0001
0.0001
0.0000
0.0931
0.0006
0.0017
0.3837
:
:
Iteration    50 | Cost: 6.308248e-02
theta = 401×1
0
0
0
0
0
0
0
0
0
0
:
:
E = 5000×1
0.5000
0.5000
0.5000

```

```

0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
:
:
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
0.0000
0.0000
-0.0000
-0.0000
-0.0000
-0.0000
:
:
E = 5000x1
0.1014
0.0864
0.0582
0.0619
0.0633
0.0800
0.0525
0.2398
0.0461
0.0794
:
:
Iteration      1 | Cost: 3.205301e-01
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
0.0000
0.0000
-0.0002
-0.0004
-0.0004
-0.0001
:
:
E = 5000x1
0.0008
0.0006
0.0008
0.0016
0.0016
0.0024
0.0009
0.0045
0.0008
0.0005
:
:

```

Iteration 2 | Cost: 3.040759e-01

theta = 401x1

1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0005
-0.0008
-0.0008
-0.0001
:
:

E = 5000x1

1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:

Iteration 3 | Cost: 1.649080e-01

theta = 401x1

0
0
0
-0.0000
0.0001
0.0002
-0.0050
-0.0076
-0.0057
-0.0009
:
:

E = 5000x1

1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:

theta = 401x1

0
0
0
-0.0000
0.0000
0.0001

```

-0.0028
-0.0042
-0.0032
-0.0005
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0017
-0.0025
-0.0020
-0.0003
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0010
-0.0015
-0.0013
-0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      4 | Cost: 1.438784e-01
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0010
-0.0015
-0.0009
-0.0001
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      5 | Cost: 9.416994e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0010
-0.0013
0.0002
0.0005
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

```

```

      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0010
     -0.0015
     -0.0008
     -0.0000
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration      6 | Cost: 9.044270e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0010
     -0.0014
     -0.0006
      0.0001
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000

```



```

-0.0010
-0.0014
-0.0001
0.0004
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      7 | Cost: 7.499076e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0010
-0.0014
0.0002
0.0005
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0010
-0.0014
-0.0000
0.0004
:
:
E = 5000×1
1.0e+00 *
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      8 | Cost: 7.202465e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0010
-0.0013
0.0003
0.0006
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0010
-0.0013
0.0010
0.0010
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

```

```

      :
      :
Iteration      9 | Cost: 6.313221e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0010
     -0.0011
      0.0028
      0.0021
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0010
     -0.0013
      0.0013
      0.0012
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration     10 | Cost: 6.168143e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000

```

```

0.0000
-0.0010
-0.0012
0.0017
0.0015
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0010
-0.0012
0.0024
0.0019
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    11 | Cost: 5.762801e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0010
-0.0010
0.0038
0.0027
:
:
E = 5000x1
1.0e+00 *

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0001
-0.0010
-0.0011
0.0028
0.0021
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      12 | Cost: 5.638036e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0001
-0.0010
-0.0011
0.0032
0.0024
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

```

```

0.0000
:
:
Iteration    13 | Cost: 5.517793e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0010
-0.0010
0.0046
0.0033
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    14 | Cost: 5.405985e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0010
-0.0008
0.0065
0.0044
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    15 | Cost: 5.332997e-02
theta = 401x1
0
0
0

```

```

-0.0000
 0.0000
 0.0001
-0.0010
-0.0007
 0.0081
 0.0055
  :
  :
E = 5000×1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  :
  :
Iteration    16 | Cost: 5.177817e-02
theta = 401×1
      0
      0
      0
-0.0000
 0.0000
 0.0002
-0.0010
-0.0007
 0.0082
 0.0056
  :
  :
E = 5000×1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  :
  :
Iteration    17 | Cost: 5.019780e-02
theta = 401×1
      0
      0
      0
-0.0000
 0.0000
 0.0002
-0.0010
-0.0007
 0.0086
 0.0060

```

```

      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
     0.0002
    -0.0010
    -0.0007
     0.0083
     0.0057
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
Iteration    18 | Cost: 5.009061e-02
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
     0.0002
    -0.0010
    -0.0007
     0.0084
     0.0057
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000

```



```

0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0010
-0.0007
0.0085
0.0059
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0010
-0.0007
0.0089
0.0062
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    19 | Cost: 4.933097e-02
theta = 401x1
0

```

```

0
0
-0.0000
0.0000
0.0002
-0.0010
-0.0007
0.0093
0.0065
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0010
-0.0007
0.0090
0.0063
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    20 | Cost: 4.906466e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0010
-0.0007
0.0095
0.0066

```

```

      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
     0.0002
    -0.0010
    -0.0006
     0.0104
     0.0073
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
Iteration    21 | Cost: 4.795494e-02
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
     0.0003
    -0.0010
    -0.0006
     0.0117
     0.0082
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
    0
    0
    0
-0.0000
0.0000
0.0002
-0.0010
-0.0006
0.0105
0.0074
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    22 | Cost: 4.787525e-02
theta = 401x1
    0
    0
    0
-0.0000
0.0000
0.0002
-0.0010
-0.0006
0.0107
0.0076
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
    0

```

```

0
0
-0.0000
0.0000
0.0002
-0.0010
-0.0006
0.0112
0.0079
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0003
-0.0010
-0.0006
0.0118
0.0083
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    23 | Cost: 4.736362e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0003
-0.0010
-0.0005
0.0125
0.0088

```

```

      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :

```

```

theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
     0.0003
    -0.0010
    -0.0005
     0.0123
     0.0086
      :
      :

```

```

E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :

```

```

Iteration    24 | Cost: 4.703862e-02
theta = 401×1

```

```

      0
      0
      0
    -0.0000
     0.0000
     0.0003
    -0.0010
    -0.0005
     0.0130
     0.0091
      :
      :

```

```

E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0003
-0.0010
-0.0004
0.0144
0.0101
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    25 | Cost: 4.594096e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0004
-0.0010
-0.0003
0.0165
0.0116
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0

```

```

0
0
-0.0000
0.0000
0.0003
-0.0010
-0.0004
0.0146
0.0102
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    26 | Cost: 4.581042e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0003
-0.0010
-0.0004
0.0149
0.0105
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0004
-0.0010
-0.0003
0.0156
0.0109

```



```

      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
    0.0000
    0.0004
    -0.0010
    -0.0002
    0.0176
    0.0123
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
Iteration    27 | Cost: 4.439905e-02
theta = 401×1
      0
      0
      0
    -0.0000
    0.0000
    0.0005
    -0.0010
    -0.0001
    0.0192
    0.0135
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0004
-0.0010
-0.0002
0.0179
0.0126
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    28 | Cost: 4.419351e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0005
-0.0010
-0.0002
0.0188
0.0132
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0

```

```

0
0
-0.0000
0.0000
0.0005
-0.0010
-0.0001
0.0207
0.0146
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    29 | Cost: 4.354885e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0006
-0.0010
0.0000
0.0226
0.0160
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    30 | Cost: 4.267120e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0005
-0.0010
-0.0002
0.0190

```

```

0.0134
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0006
-0.0010
-0.0000
0.0223
0.0157
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    31 | Cost: 4.260390e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0006
-0.0010
-0.0000
0.0223
0.0158
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0006
-0.0010
-0.0000
0.0225
0.0159
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    32 | Cost: 4.239241e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0006
-0.0010
0.0000
0.0227
0.0161
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1

```

```

0
0
0
-0.0000
0.0000
0.0006
-0.0010
-0.0000
0.0226
0.0160
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    33 | Cost: 4.229369e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0006
-0.0010
0.0000
0.0230
0.0163
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    34 | Cost: 4.216084e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0006
-0.0010
0.0000

```

```

0.0233
0.0166
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0006
-0.0010
0.0000
0.0237
0.0169
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
Iteration    35 | Cost: 4.196196e-02
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0006
-0.0010
0.0001
0.0246
0.0176
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0006
-0.0010
0.0000
0.0240
0.0171
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    36 | Cost: 4.190514e-02
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0006
-0.0010
0.0000
0.0243
0.0174
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:

```



```

theta = 401x1
    0
    0
    0
-0.0000
-0.0000
 0.0006
-0.0010
 0.0001
 0.0250
 0.0179
    :
    :
E = 5000x1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
    :
    :
theta = 401x1
    0
    0
    0
-0.0000
-0.0000
 0.0007
-0.0010
 0.0001
 0.0271
 0.0196
    :
    :
E = 5000x1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
    :
    :
theta = 401x1
    0
    0
    0
-0.0000
-0.0000
 0.0009
-0.0010
 0.0003
 0.0335

```

```

0.0247
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
Iteration 37 | Cost: 4.040833e-02
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0011
-0.0010
0.0006
0.0427
0.0321
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0009
-0.0010
0.0004
0.0348
0.0258
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      38 | Cost: 4.017017e-02
theta = 401x1
      0
      0
      0
-0.0000
-0.0000
 0.0009
-0.0010
 0.0004
 0.0361
 0.0268
      :
      :
E = 5000x1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
      :
      :
theta = 401x1
      0
      0
      0
-0.0000
-0.0000
 0.0010
-0.0010
 0.0005
 0.0385
 0.0287
      :
      :
E = 5000x1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
      :
      :
theta = 401x1

```

```

0
0
0
-0.0000
-0.0000
0.0012
-0.0010
0.0007
0.0439
0.0330
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    39 | Cost: 3.857779e-02
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0015
-0.0009
0.0011
0.0580
0.0441
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    40 | Cost: 3.694945e-02
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0019
-0.0009
0.0016

```

```

0.0724
0.0555
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0016
-0.0009
0.0013
0.0614
0.0469
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
Iteration    41 | Cost: 3.657047e-02
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0018
-0.0009
0.0014
0.0662
0.0507
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    42 | Cost: 3.603666e-02
theta = 401x1
      0
      0
      0
-0.0000
-0.0000
 0.0018
-0.0009
 0.0015
 0.0673
 0.0516
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
-0.0000
-0.0000
 0.0018
-0.0009
 0.0015
 0.0667
 0.0511
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :

```

Iteration 43 | Cost: 3.583073e-02

theta = 401x1

0
0
0

-0.0000
-0.0000
0.0018
-0.0009
0.0015
0.0674
0.0516

⋮

E = 5000x1

1.0e+00 *

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

⋮

Iteration 44 | Cost: 3.569197e-02

theta = 401x1

0
0
0

-0.0000
-0.0000
0.0019
-0.0009
0.0019
0.0750
0.0583

⋮

E = 5000x1

1.0e+00 *

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

⋮

theta = 401x1

0
0
0

-0.0000
-0.0000
0.0018
-0.0009

```

0.0015
0.0681
0.0523
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0018
-0.0009
0.0015
0.0675
0.0517
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    45 | Cost: 3.568871e-02
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0018
-0.0009
0.0015
0.0675
0.0517
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000

```



```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0018
-0.0009
0.0015
0.0675
0.0517
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0018
-0.0009
0.0015
0.0675
0.0518
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:

```

Iteration 46 | Cost: 3.565251e-02

theta = 401x1

0
0
0

-0.0000
-0.0000
0.0018
-0.0009
0.0015
0.0675
0.0518

⋮

E = 5000x1

1.0e+00 *

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

⋮

theta = 401x1

0
0
0

-0.0000
-0.0000
0.0018
-0.0009
0.0015
0.0676
0.0518

⋮

E = 5000x1

1.0e+00 *

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

⋮

Iteration 47 | Cost: 3.555689e-02

theta = 401x1

0
0
0

-0.0000
-0.0000
0.0018
-0.0009

```

0.0015
0.0678
0.0520
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0018
-0.0009
0.0015
0.0676
0.0519
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    48 | Cost: 3.553070e-02
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0018
-0.0009
0.0015
0.0678
0.0520
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0018
-0.0009
0.0015
0.0680
0.0523
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    49 | Cost: 3.545854e-02
theta = 401x1
0
0
0
-0.0000
-0.0000
0.0018
-0.0009
0.0015
0.0684
0.0527
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

```

```

      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
     -0.0000
      0.0018
     -0.0009
      0.0015
      0.0682
      0.0525
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration    50 | Cost: 3.542453e-02
theta = 401x1
      0
      0
      0
      0
      0
      0
      0
      0
      0
      0
      :
      :
E = 5000x1
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
      0.0000

```

```

-0.0000
-0.0000
-0.0000
-0.0000
:
:
E = 5000×1
0.1115
0.0955
0.0613
0.0645
0.0693
0.0846
0.0553
0.2510
0.0493
0.0874
:
:
Iteration      1 | Cost: 3.314410e-01
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0005
-0.0005
-0.0002
:
:
E = 5000×1
0.9454
0.9563
0.2992
0.2691
0.9807
0.7183
0.3513
0.3891
0.7261
0.9241
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0002
-0.0002
-0.0002
-0.0001
:
:
E = 5000×1
0.5374
0.5400

```

```

0.1323
0.1281
0.5868
0.2925
0.1378
0.3093
0.2346
0.4607
:
:
Iteration      2 | Cost: 2.217377e-01
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
     0.0000
     0.0000
    -0.0002
    -0.0004
    -0.0004
    -0.0002
      :
      :
E = 5000x1
    0.0072
    0.0054
    0.0005
    0.0003
    0.0026
    0.0015
    0.0001
    0.0250
    0.0005
    0.0041
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
     0.0000
     0.0000
    -0.0002
    -0.0003
    -0.0003
    -0.0001
      :
      :
E = 5000x1
    0.1494
    0.1373
    0.0180
    0.0150
    0.1197
    0.0487
    0.0113
    0.1340
    0.0273
    0.1055

```

```

      :
      :
Iteration      3 | Cost: 1.929205e-01
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0003
     -0.0006
     -0.0007
     -0.0003
      :
      :
E = 5000x1
      0.0015
      0.0019
      0.0019
      0.0002
      0.0005
      0.0007
      0.0000
      0.0081
      0.0010
      0.0037
      :
      :
Iteration      4 | Cost: 1.568866e-01
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0003
     -0.0006
     -0.0007
     -0.0003
      :
      :
E = 5000x1
      0.0331
      0.0574
      0.0850
      0.0084
      0.0310
      0.0271
      0.0006
      0.0414
      0.0849
      0.1209
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000

```



```

0.0000
0.0000
-0.0003
-0.0006
-0.0007
-0.0003
:
:
E = 5000×1
0.0054
0.0077
0.0090
0.0009
0.0027
0.0031
0.0001
0.0158
0.0062
0.0158
:
:
Iteration      5 | Cost: 1.318005e-01
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0006
-0.0008
-0.0003
:
:
E = 5000×1
0.0290
0.0622
0.0106
0.0032
0.0927
0.1503
0.0002
0.1020
0.0373
0.0408
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0006
-0.0007
-0.0003
:
:
E = 5000×1

```

```

0.0180
0.0347
0.0101
0.0022
0.0351
0.0527
0.0001
0.0610
0.0225
0.0312
:
:
Iteration      6 | Cost: 1.147878e-01
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
     0.0000
     0.0000
    -0.0003
    -0.0006
    -0.0008
    -0.0004
      :
      :
E = 5000x1
    0.0016
    0.0034
    0.0004
    0.0001
    0.0042
    0.0184
    0.0000
    0.0403
    0.0011
    0.0015
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
     0.0000
     0.0000
    -0.0003
    -0.0006
    -0.0008
    -0.0003
      :
      :
E = 5000x1
    0.0114
    0.0222
    0.0053
    0.0013
    0.0234
    0.0431
    0.0001
    0.0563
    0.0127

```

```

0.0176
:
:
Iteration      7 | Cost: 1.124131e-01
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
      0.0000
      0.0000
    -0.0003
    -0.0006
    -0.0008
    -0.0004
      :
      :
E = 5000x1
      0.0080
      0.0173
      0.0049
      0.0013
      0.0200
      0.0533
      0.0000
      0.0635
      0.0126
      0.0130
      :
      :
Iteration      8 | Cost: 1.083564e-01
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
      0.0000
      0.0000
    -0.0003
    -0.0006
    -0.0009
    -0.0004
      :
      :
E = 5000x1
      0.0133
      0.0299
      0.0119
      0.0028
      0.0353
      0.0835
      0.0001
      0.0783
      0.0300
      0.0259
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0

```

```

-0.0000
 0.0000
 0.0000
-0.0003
-0.0006
-0.0008
-0.0004
  ⋮
  ⋮
E = 5000×1
 0.0102
 0.0224
 0.0074
 0.0019
 0.0262
 0.0659
 0.0001
 0.0701
 0.0190
 0.0180
  ⋮
  ⋮
Iteration      9 | Cost: 1.069107e-01
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0003
-0.0006
-0.0009
-0.0004
  ⋮
  ⋮
E = 5000×1
 0.0079
 0.0171
 0.0083
 0.0018
 0.0168
 0.0412
 0.0000
 0.0572
 0.0169
 0.0166
  ⋮
  ⋮
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0004
-0.0006
-0.0010
-0.0004
  ⋮
  ⋮

```

```

E = 5000×1
  0.0049
  0.0100
  0.0104
  0.0016
  0.0069
  0.0156
  0.0000
  0.0377
  0.0133
  0.0142
  ⋮
Iteration    10 | Cost: 1.022962e-01
theta = 401×1
    0
    0
    0
 -0.0000
  0.0000
  0.0000
 -0.0004
 -0.0007
 -0.0012
 -0.0005
  ⋮
  ⋮
E = 5000×1
  0.0014
  0.0024
  0.0016
  0.0002
  0.0016
  0.0025
  0.0000
  0.0203
  0.0018
  0.0038
  ⋮
  ⋮
theta = 401×1
    0
    0
    0
 -0.0000
  0.0000
  0.0000
 -0.0004
 -0.0006
 -0.0010
 -0.0005
  ⋮
  ⋮
E = 5000×1
  0.0039
  0.0078
  0.0075
  0.0011
  0.0054
  0.0114
  0.0000
  0.0339
  0.0095
  0.0114

```

```

      :
      :
Iteration    11 | Cost: 1.017049e-01
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0004
     -0.0006
     -0.0011
     -0.0005
      :
      :
E = 5000x1
      0.0040
      0.0079
      0.0067
      0.0010
      0.0059
      0.0105
      0.0000
      0.0346
      0.0091
      0.0119
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0004
     -0.0007
     -0.0012
     -0.0005
      :
      :
E = 5000x1
      0.0042
      0.0081
      0.0055
      0.0008
      0.0071
      0.0087
      0.0000
      0.0361
      0.0082
      0.0130
      :
      :
Iteration    12 | Cost: 9.879326e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0004

```

```

-0.0007
-0.0013
-0.0006
:
:
E = 5000×1
0.0070
0.0142
0.0097
0.0014
0.0143
0.0144
0.0000
0.0466
0.0161
0.0239
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0007
-0.0013
-0.0006
:
:
E = 5000×1
0.0059
0.0118
0.0080
0.0011
0.0114
0.0122
0.0000
0.0429
0.0130
0.0196
:
:
Iteration    13 | Cost: 9.731696e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0015
-0.0006
:
:
E = 5000×1
0.0058
0.0118
0.0085
0.0012
0.0114

```

```

0.0110
0.0000
0.0392
0.0118
0.0205
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0000
-0.0005
-0.0008
-0.0018
-0.0008
:
:
E = 5000x1
0.0057
0.0118
0.0096
0.0012
0.0115
0.0088
0.0000
0.0328
0.0097
0.0222
:
:
Iteration    14 | Cost: 9.216899e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0000
-0.0006
-0.0009
-0.0023
-0.0010
:
:
E = 5000x1
0.0018
0.0036
0.0027
0.0003
0.0032
0.0023
0.0000
0.0173
0.0019
0.0074
:
:
theta = 401x1
0
0
0

```



```

-0.0000
 0.0000
-0.0000
-0.0005
-0.0008
-0.0020
-0.0009
  ⋮
  ⋮
E = 5000×1
 0.0034
 0.0069
 0.0054
 0.0006
 0.0064
 0.0048
 0.0000
 0.0245
 0.0046
 0.0135
  ⋮
  ⋮
Iteration    15 | Cost: 9.032623e-02
theta = 401×1
 0
 0
 0
-0.0000
 0.0000
-0.0000
-0.0006
-0.0009
-0.0025
-0.0011
  ⋮
  ⋮
E = 5000×1
 0.0020
 0.0042
 0.0031
 0.0003
 0.0049
 0.0029
 0.0000
 0.0214
 0.0028
 0.0103
  ⋮
  ⋮
theta = 401×1
 0
 0
 0
-0.0000
 0.0000
-0.0001
-0.0008
-0.0011
-0.0035
-0.0015
  ⋮
  ⋮
E = 5000×1
 0.0007

```

```

0.0015
0.0010
0.0001
0.0028
0.0011
0.0000
0.0164
0.0010
0.0060
:
:
Iteration    16 | Cost: 8.409627e-02
theta = 401x1
    0
    0
    0
-0.0000
0.0000
-0.0001
-0.0010
-0.0013
-0.0043
-0.0019
:
:
E = 5000x1
0.0011
0.0031
0.0022
0.0001
0.0096
0.0020
0.0000
0.0262
0.0030
0.0181
:
:
theta = 401x1
    0
    0
    0
-0.0000
0.0000
-0.0001
-0.0009
-0.0012
-0.0039
-0.0017
:
:
E = 5000x1
0.0009
0.0021
0.0014
0.0001
0.0048
0.0014
0.0000
0.0202
0.0016
0.0098
:
:

```

Iteration 17 | Cost: 8.140204e-02

theta = 401x1

0
0
0

-0.0000
0.0000
-0.0001
-0.0011
-0.0014
-0.0049
-0.0022

⋮

E = 5000x1

0.0006
0.0016
0.0008
0.0000
0.0037
0.0005
0.0000
0.0177
0.0010
0.0111

⋮

Iteration 18 | Cost: 7.863906e-02

theta = 401x1

0
0
0

-0.0000
0.0000
-0.0001
-0.0014
-0.0015
-0.0056
-0.0025

⋮

E = 5000x1

0.0001
0.0002
0.0001
0.0000
0.0002
0.0000
0.0000
0.0044
0.0001
0.0015

⋮

theta = 401x1

0
0
0

-0.0000
0.0000
-0.0001
-0.0012
-0.0014
-0.0049

```

-0.0022
:
E = 5000×1
0.0005
0.0013
0.0006
0.0000
0.0026
0.0004
0.0000
0.0149
0.0007
0.0086
:
Iteration 19 | Cost: 7.835122e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0012
-0.0014
-0.0051
-0.0023
:
E = 5000×1
0.0005
0.0012
0.0006
0.0000
0.0022
0.0003
0.0000
0.0130
0.0006
0.0081
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0013
-0.0015
-0.0054
-0.0024
:
E = 5000×1
0.0004
0.0011
0.0007
0.0000
0.0015
0.0002
0.0000

```

```

0.0100
0.0005
0.0071
:
:
Iteration    20 | Cost: 7.711350e-02
theta = 401x1
      0
      0
      0
    -0.0000
     0.0000
    -0.0001
    -0.0014
    -0.0015
    -0.0055
    -0.0025
      :
      :
E = 5000x1
     0.0007
     0.0020
     0.0013
     0.0001
     0.0029
     0.0004
     0.0000
     0.0127
     0.0010
     0.0128
      :
      :
theta = 401x1
      0
      0
      0
    -0.0000
     0.0000
    -0.0001
    -0.0013
    -0.0015
    -0.0054
    -0.0024
      :
      :
E = 5000x1
     0.0005
     0.0014
     0.0009
     0.0000
     0.0020
     0.0003
     0.0000
     0.0110
     0.0007
     0.0090
      :
      :
Iteration    21 | Cost: 7.671192e-02
theta = 401x1
      0
      0
      0
    -0.0000

```

```

0.0000
-0.0001
-0.0014
-0.0015
-0.0056
-0.0025
:
:
E = 5000×1
0.0005
0.0014
0.0008
0.0000
0.0022
0.0003
0.0000
0.0124
0.0007
0.0084
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0015
-0.0016
-0.0058
-0.0027
:
:
E = 5000×1
0.0004
0.0014
0.0005
0.0000
0.0028
0.0005
0.0000
0.0157
0.0007
0.0074
:
:
Iteration    22 | Cost: 7.538515e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0002
-0.0017
-0.0016
-0.0062
-0.0029
:
:
E = 5000×1
0.0002
0.0006

```

```

0.0002
0.0000
0.0011
0.0003
0.0000
0.0117
0.0002
0.0025
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0016
-0.0016
-0.0059
-0.0027
:
:
E = 5000x1
0.0004
0.0012
0.0004
0.0000
0.0024
0.0004
0.0000
0.0148
0.0006
0.0060
:
:
Iteration    23 | Cost: 7.517315e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0016
-0.0016
-0.0060
-0.0028
:
:
E = 5000x1
0.0004
0.0013
0.0004
0.0000
0.0023
0.0005
0.0000
0.0150
0.0005
0.0058
:
:
theta = 401x1

```

```

0
0
0
-0.0000
0.0000
-0.0002
-0.0017
-0.0016
-0.0063
-0.0029
:
:
E = 5000×1
0.0004
0.0015
0.0004
0.0000
0.0023
0.0005
0.0000
0.0154
0.0005
0.0055
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0002
-0.0020
-0.0018
-0.0068
-0.0032
:
:
E = 5000×1
0.0004
0.0020
0.0005
0.0000
0.0021
0.0006
0.0000
0.0163
0.0004
0.0048
:
:
Iteration    24 | Cost: 7.352966e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0002
-0.0023
-0.0019
-0.0074
-0.0035

```



```

      :
      :
E = 5000×1
    0.0010
    0.0061
    0.0011
    0.0000
    0.0049
    0.0016
    0.0000
    0.0256
    0.0008
    0.0094
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
    -0.0002
    -0.0021
    -0.0018
    -0.0071
    -0.0033
      :
      :
E = 5000×1
    0.0007
    0.0035
    0.0007
    0.0000
    0.0032
    0.0010
    0.0000
    0.0203
    0.0005
    0.0067
      :
      :
Iteration    25 | Cost: 7.269690e-02
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
    -0.0002
    -0.0022
    -0.0019
    -0.0074
    -0.0035
      :
      :
E = 5000×1
    0.0006
    0.0033
    0.0006
    0.0000
    0.0035
    0.0010
    0.0000
    0.0267

```

```

0.0006
0.0067
:
:
Iteration    26 | Cost: 7.167827e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0002
-0.0023
-0.0019
-0.0076
-0.0036
:
:
E = 5000x1
0.0002
0.0012
0.0002
0.0000
0.0011
0.0003
0.0000
0.0195
0.0002
0.0025
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0002
-0.0022
-0.0019
-0.0074
-0.0035
:
:
E = 5000x1
0.0005
0.0028
0.0006
0.0000
0.0029
0.0009
0.0000
0.0255
0.0005
0.0058
:
:
Iteration    27 | Cost: 7.156798e-02
theta = 401x1
0
0
0
-0.0000
0.0000

```

```

-0.0002
-0.0023
-0.0019
-0.0075
-0.0035
:
:
E = 5000×1
0.0005
0.0026
0.0006
0.0000
0.0027
0.0008
0.0000
0.0255
0.0005
0.0056
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0002
-0.0023
-0.0019
-0.0076
-0.0036
:
:
E = 5000×1
0.0004
0.0023
0.0005
0.0000
0.0023
0.0006
0.0000
0.0255
0.0005
0.0050
:
:
Iteration    28 | Cost: 7.107344e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0002
-0.0024
-0.0019
-0.0077
-0.0037
:
:
E = 5000×1
0.0005
0.0026
0.0007

```

```

0.0000
0.0026
0.0006
0.0000
0.0281
0.0006
0.0059
:
:
Iteration    29 | Cost: 7.057249e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
-0.0002
-0.0023
-0.0019
-0.0076
-0.0036
:
:
E = 5000x1
0.0017
0.0111
0.0015
0.0001
0.0096
0.0024
0.0000
0.0320
0.0010
0.0141
:
:
theta = 401x1
      0
      0
      0
-0.0000
0.0000
-0.0002
-0.0024
-0.0019
-0.0077
-0.0037
:
:
E = 5000x1
0.0006
0.0030
0.0008
0.0000
0.0030
0.0007
0.0000
0.0285
0.0006
0.0065
:
:
Iteration    30 | Cost: 7.054742e-02
theta = 401x1

```

```

0
0
0
-0.0000
0.0000
-0.0002
-0.0024
-0.0019
-0.0077
-0.0037
:
:
E = 5000×1
0.0006
0.0029
0.0007
0.0000
0.0029
0.0007
0.0000
0.0277
0.0006
0.0061
:
:
Iteration 31 | Cost: 7.051131e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0002
-0.0024
-0.0019
-0.0077
-0.0037
:
:
E = 5000×1
0.0006
0.0031
0.0007
0.0000
0.0030
0.0007
0.0000
0.0280
0.0006
0.0063
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0002
-0.0024
-0.0019
-0.0078
-0.0037

```

```

      :
      :
E = 5000×1
    0.0006
    0.0034
    0.0008
    0.0000
    0.0033
    0.0007
    0.0000
    0.0287
    0.0006
    0.0067
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
    -0.0002
    -0.0024
    -0.0019
    -0.0078
    -0.0038
      :
      :
E = 5000×1
    0.0008
    0.0041
    0.0009
    0.0000
    0.0039
    0.0008
    0.0000
    0.0301
    0.0007
    0.0076
      :
      :
Iteration    32 | Cost: 7.027145e-02
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
    -0.0002
    -0.0025
    -0.0020
    -0.0080
    -0.0039
      :
      :
E = 5000×1
    0.0008
    0.0042
    0.0008
    0.0000
    0.0038
    0.0007
    0.0000
    0.0293

```

```

0.0005
0.0067
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0002
-0.0025
-0.0020
-0.0079
-0.0038
:
:
E = 5000x1
0.0008
0.0041
0.0008
0.0000
0.0038
0.0008
0.0000
0.0297
0.0006
0.0071
:
:
Iteration 33 | Cost: 7.015020e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0002
-0.0025
-0.0020
-0.0080
-0.0039
:
:
E = 5000x1
0.0008
0.0045
0.0008
0.0000
0.0043
0.0008
0.0000
0.0315
0.0007
0.0076
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0003

```

```

-0.0026
-0.0020
-0.0082
-0.0040
:
:
E = 5000×1
0.0009
0.0053
0.0009
0.0000
0.0053
0.0009
0.0000
0.0355
0.0007
0.0086
:
:
Iteration    34 | Cost: 6.963282e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0003
-0.0027
-0.0021
-0.0084
-0.0042
:
:
E = 5000×1
0.0008
0.0042
0.0007
0.0000
0.0042
0.0006
0.0000
0.0349
0.0006
0.0071
:
:
Iteration    35 | Cost: 6.921892e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0003
-0.0028
-0.0021
-0.0086
-0.0043
:
:
E = 5000×1
0.0007
0.0040
0.0007

```



```

0.0000
0.0042
0.0005
0.0000
0.0384
0.0007
0.0075
:
:
Iteration    36 | Cost: 6.867102e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
-0.0003
-0.0027
-0.0021
-0.0084
-0.0042
:
:
E = 5000x1
0.0016
0.0094
0.0021
0.0001
0.0088
0.0012
0.0000
0.0444
0.0017
0.0161
:
:
theta = 401x1
      0
      0
      0
-0.0000
0.0000
-0.0003
-0.0028
-0.0021
-0.0086
-0.0043
:
:
E = 5000x1
0.0008
0.0044
0.0008
0.0000
0.0045
0.0006
0.0000
0.0390
0.0008
0.0081
:
:
Iteration    37 | Cost: 6.864035e-02
theta = 401x1

```

```

0
0
0
-0.0000
0.0000
-0.0003
-0.0028
-0.0021
-0.0086
-0.0043
:
:
E = 5000×1
0.0008
0.0043
0.0008
0.0000
0.0043
0.0006
0.0000
0.0380
0.0008
0.0080
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0003
-0.0028
-0.0021
-0.0087
-0.0043
:
:
E = 5000×1
0.0008
0.0042
0.0009
0.0000
0.0038
0.0005
0.0000
0.0360
0.0007
0.0076
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0003
-0.0028
-0.0021
-0.0087
-0.0044
:
:

```

```

E = 5000×1
  0.0007
  0.0039
  0.0009
  0.0000
  0.0031
  0.0004
  0.0000
  0.0324
  0.0007
  0.0071
  ⋮
Iteration    38 | Cost: 6.838629e-02
theta = 401×1
    0
    0
    0
 -0.0000
  0.0000
 -0.0003
 -0.0029
 -0.0021
 -0.0088
 -0.0045
  ⋮
  ⋮
E = 5000×1
  0.0010
  0.0052
  0.0015
  0.0000
  0.0036
  0.0005
  0.0000
  0.0342
  0.0010
  0.0094
  ⋮
  ⋮
theta = 401×1
    0
    0
    0
 -0.0000
  0.0000
 -0.0003
 -0.0029
 -0.0021
 -0.0087
 -0.0044
  ⋮
  ⋮
E = 5000×1
  0.0008
  0.0042
  0.0010
  0.0000
  0.0032
  0.0004
  0.0000
  0.0329
  0.0007
  0.0076

```

```

      :
      :
Iteration    39 | Cost: 6.832040e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
     -0.0003
     -0.0029
     -0.0021
     -0.0088
     -0.0044
      :
      :
E = 5000x1
      0.0008
      0.0041
      0.0010
      0.0000
      0.0031
      0.0004
      0.0000
      0.0335
      0.0007
      0.0073
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
     -0.0003
     -0.0030
     -0.0021
     -0.0089
     -0.0045
      :
      :
E = 5000x1
      0.0007
      0.0039
      0.0009
      0.0000
      0.0030
      0.0004
      0.0000
      0.0348
      0.0007
      0.0068
      :
      :
Iteration    40 | Cost: 6.803653e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
     -0.0003
     -0.0030

```

```

-0.0021
-0.0090
-0.0046
:
:
E = 5000×1
0.0008
0.0045
0.0008
0.0000
0.0038
0.0006
0.0000
0.0408
0.0008
0.0066
:
:
Iteration    41 | Cost: 6.775374e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0003
-0.0031
-0.0022
-0.0092
-0.0047
:
:
E = 5000×1
0.0007
0.0042
0.0009
0.0000
0.0031
0.0005
0.0000
0.0384
0.0007
0.0060
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0003
-0.0033
-0.0022
-0.0094
-0.0049
:
:
E = 5000×1
0.0006
0.0038
0.0009
0.0000
0.0023

```

```

0.0004
0.0000
0.0350
0.0005
0.0051
:
:
Iteration    42 | Cost: 6.726352e-02
theta = 401x1
      0
      0
      0
    -0.0000
     0.0000
    -0.0004
    -0.0037
    -0.0023
    -0.0100
    -0.0053
      :
      :
E = 5000x1
     0.0007
     0.0046
     0.0014
     0.0000
     0.0020
     0.0003
     0.0000
     0.0358
     0.0006
     0.0056
      :
      :
Iteration    43 | Cost: 6.682665e-02
theta = 401x1
      0
      0
      0
    -0.0000
     0.0000
    -0.0004
    -0.0040
    -0.0024
    -0.0105
    -0.0057
      :
      :
E = 5000x1
     0.0007
     0.0049
     0.0014
     0.0000
     0.0022
     0.0003
     0.0000
     0.0415
     0.0007
     0.0054
      :
      :
theta = 401x1
      0
      0

```

```

      0
    -0.0000
      0.0001
    -0.0005
    -0.0047
    -0.0026
    -0.0115
    -0.0064
      :
      :
E = 5000×1
      0.0007
      0.0054
      0.0015
      0.0000
      0.0026
      0.0003
      0.0000
      0.0556
      0.0008
      0.0050
      :
      :
Iteration    44 | Cost: 6.474207e-02
theta = 401×1
      0
      0
      0
    -0.0000
      0.0001
    -0.0006
    -0.0052
    -0.0027
    -0.0122
    -0.0070
      :
      :
E = 5000×1
      0.0004
      0.0029
      0.0006
      0.0000
      0.0014
      0.0002
      0.0000
      0.0528
      0.0004
      0.0021
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
      0.0001
    -0.0005
    -0.0049
    -0.0026
    -0.0118
    -0.0066
      :
      :
E = 5000×1

```

```

0.0006
0.0042
0.0010
0.0000
0.0020
0.0002
0.0000
0.0544
0.0006
0.0035
:
:
Iteration    45 | Cost: 6.414429e-02
theta = 401x1
0
0
0
-0.0000
0.0001
-0.0006
-0.0055
-0.0027
-0.0126
-0.0073
:
:
E = 5000x1
0.0005
0.0043
0.0007
0.0000
0.0027
0.0003
0.0000
0.0731
0.0006
0.0026
:
:
Iteration    46 | Cost: 6.344921e-02
theta = 401x1
0
0
0
-0.0000
0.0001
-0.0006
-0.0058
-0.0028
-0.0130
-0.0075
:
:
E = 5000x1
0.0008
0.0064
0.0010
0.0000
0.0047
0.0004
0.0000
0.0963
0.0009
0.0035

```



```

      :
      :
Iteration    47 | Cost: 6.291307e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0001
     -0.0007
     -0.0067
     -0.0030
     -0.0142
     -0.0084
      :
      :
E = 5000x1
      0.0012
      0.0108
      0.0011
      0.0000
      0.0087
      0.0006
      0.0000
      0.1355
      0.0013
      0.0035
      :
      :
Iteration    48 | Cost: 6.234624e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0001
     -0.0008
     -0.0070
     -0.0031
     -0.0147
     -0.0088
      :
      :
E = 5000x1
      0.0010
      0.0090
      0.0008
      0.0000
      0.0065
      0.0004
      0.0000
      0.1278
      0.0008
      0.0024
      :
      :
Iteration    49 | Cost: 6.196919e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0001
     -0.0010

```

```

-0.0092
-0.0035
-0.0175
-0.0108
:
:
E = 5000×1
0.0011
0.0138
0.0008
0.0000
0.0047
0.0002
0.0000
0.1497
0.0005
0.0013
:
:
theta = 401×1
0
0
0
-0.0000
0.0001
-0.0008
-0.0074
-0.0032
-0.0152
-0.0091
:
:
E = 5000×1
0.0010
0.0098
0.0008
0.0000
0.0061
0.0004
0.0000
0.1317
0.0008
0.0021
:
:
Iteration    50 | Cost: 6.185739e-02
theta = 401×1
0
0
0
0
0
0
0
0
0
0
:
:
E = 5000×1
0.5000
0.5000
0.5000
0.5000

```

```

0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
:
:
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0000
-0.0000
-0.0000
-0.0000
-0.0000
:
:
E = 5000x1
0.1060
0.0860
0.0611
0.0663
0.0580
0.0760
0.0509
0.2352
0.0474
0.0783
:
:
Iteration      1 | Cost: 3.354875e-01
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0002
-0.0003
-0.0003
-0.0001
:
:
E = 5000x1
0.1262
0.0084
0.1780
0.4960
0.0003
0.0022
0.0036
0.0075
0.0741
0.0048
:
:
Iteration      2 | Cost: 2.188639e-01

```

```

theta = 401x1
1.0e+00 *
    0
    0
    0
   -0.0000
    0.0000
   -0.0000
   -0.0003
   -0.0005
   -0.0006
   -0.0003
    :
    :
E = 5000x1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0001
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :
Iteration      3 | Cost: 9.772130e-02
theta = 401x1
    0
    0
    0
   -0.0000
    0.0001
   -0.0002
   -0.0022
   -0.0037
   -0.0046
   -0.0022
    :
    :
E = 5000x1
    0.0000
    0.0000
    0.0000
    0.7315
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :
theta = 401x1
    0
    0
    0
   -0.0000
    0.0000
   -0.0001
   -0.0012
   -0.0021

```

```

-0.0026
-0.0012
:
E = 5000×1
0.0000
0.0000
0.0000
0.0191
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0008
-0.0013
-0.0016
-0.0008
:
E = 5000×1
0.0000
0.0000
0.0000
0.0016
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0006
-0.0009
-0.0011
-0.0005
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0005
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0002
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      4 | Cost: 8.460314e-02
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
:
:
E = 5000x1
0.0000
0.0000
0.0003
0.0024
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      5 | Cost: 5.991024e-02
theta = 401x1

```

```

1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000
     -0.0004
     -0.0006
     -0.0007
     -0.0003
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0001
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000
     -0.0004
     -0.0007
     -0.0008
     -0.0004
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0001
      0.0009
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration      6 | Cost: 5.318810e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000

```

```

-0.0004
-0.0007
-0.0008
-0.0004
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0001
0.0009
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      7 | Cost: 4.521935e-02
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
:
:
E = 5000×1
0.0002
0.0000
0.0005
0.0031
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      8 | Cost: 4.117442e-02
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
:
:
E = 5000×1

```



```

1.0e+00 *
    0.0002
    0.0000
    0.0002
    0.0005
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :
theta = 401x1
1.0e+00 *
    0
    0
    0
    -0.0000
    0.0000
    -0.0000
    -0.0004
    -0.0007
    -0.0008
    -0.0004
    :
    :
E = 5000x1
    0.0002
    0.0000
    0.0004
    0.0021
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :
Iteration      9 | Cost: 3.978801e-02
theta = 401x1
1.0e+00 *
    0
    0
    0
    -0.0000
    0.0000
    -0.0000
    -0.0004
    -0.0007
    -0.0008
    -0.0004
    :
    :
E = 5000x1
    0.0001
    0.0000
    0.0002
    0.0011
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000

```

```
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
 0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
    :
    :
```

```
E = 5000x1
0.0002
0.0000
0.0004
0.0021
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
```

```
Iteration          9 | Cost: 3.978801e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
  ⋮
```

```
E = 5000x1
0.0001
0.0000
0.0002
0.0011
0.0000
0.0000
0.0000
0.0000
```

```

0.0000
0.0000
:
Iteration    10 | Cost: 3.874084e-02
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
:
E = 5000x1
0.0001
0.0000
0.0002
0.0011
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
Iteration    11 | Cost: 3.814846e-02
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0003
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
theta = 401x1
1.0e+00 *
    0

```

```

0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0007
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
:
:
E = 5000x1
1.0e+00 *
0.0001
0.0000
0.0001
0.0010
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration 12 | Cost: 3.812015e-02
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007

```

```

-0.0008
-0.0004
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0001
0.0010
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0001
0.0009
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000

```

```

0.0001
0.0008
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    13 | Cost: 3.791387e-02
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
:
:
E = 5000x1
1.0e+00 *
0.0001
0.0000
0.0001
0.0009
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
0.0000
-0.0000
-0.0004
-0.0007
-0.0008
-0.0004
:
:
E = 5000x1
0.0001
0.0000
0.0002
0.0012
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

```

```

      :
      :
Iteration    14 | Cost: 3.720946e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000
     -0.0004
     -0.0007
     -0.0008
     -0.0004
      :
      :
E = 5000x1
1.0e+00 *
      0.0001
      0.0000
      0.0002
      0.0009
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000
     -0.0004
     -0.0007
     -0.0008
     -0.0003
      :
      :
E = 5000x1
1.0e+00 *
      0.0001
      0.0000
      0.0001
      0.0007
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration    15 | Cost: 3.578365e-02
theta = 401x1
1.0e+00 *
      0
      0

```

```

0
-0.0000
0.0000
-0.0000
-0.0004
-0.0008
-0.0009
-0.0003
:
E = 5000x1
0.0001
0.0000
0.0003
0.0012
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0008
-0.0008
-0.0003
:
E = 5000x1
0.0001
0.0000
0.0002
0.0010
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
Iteration    16 | Cost: 3.474696e-02
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0000
-0.0004
-0.0008
-0.0008
-0.0003

```

```

      :
      :
E = 5000×1
  0.0000
  0.0000
  0.0003
  0.0013
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
      :
      :
Iteration    17 | Cost: 3.395842e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000
     -0.0004
     -0.0008
     -0.0009
     -0.0003
      :
      :
E = 5000×1
1.0e+00 *
      0.0000
      0.0000
      0.0002
      0.0006
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000
     -0.0004
     -0.0008
     -0.0008
     -0.0003
      :
      :
E = 5000×1
1.0e+00 *
      0.0000
      0.0000
      0.0002
      0.0009

```



```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      18 | Cost: 3.351052e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000
     -0.0004
     -0.0008
     -0.0009
     -0.0003
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0001
      0.0007
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000
     -0.0004
     -0.0008
     -0.0009
     -0.0003
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0002
      0.0008
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000

```

```

      :
      :
Iteration    19 | Cost: 3.326145e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000
     -0.0004
     -0.0008
     -0.0009
     -0.0003
      :
      :
E = 5000x1
      0.0000
      0.0000
      0.0002
      0.0012
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000
     -0.0004
     -0.0008
     -0.0009
     -0.0003
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0002
      0.0010
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration    20 | Cost: 3.314033e-02
theta = 401x1
1.0e+00 *
      0
      0
      0

```

```

-0.0000
 0.0000
-0.0000
-0.0004
-0.0008
-0.0009
-0.0003
  :
  :
E = 5000×1
1.0e+00 *
 0.0000
 0.0000
 0.0002
 0.0010
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  :
  :
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
-0.0000
-0.0004
-0.0008
-0.0009
-0.0003
  :
  :
E = 5000×1
 0.0000
 0.0000
 0.0002
 0.0010
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  :
  :
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
-0.0001
-0.0004
-0.0008
-0.0009
-0.0003
  :
  :

```

```
E = 5000x1
0.0000
0.0000
0.0001
0.0011
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
⋮
⋮
Iteration      21 | Cost: 3.180976e-02
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0001
-0.0004
-0.0009
-0.0009
-0.0003
⋮
⋮
E = 5000x1
0.0000
0.0000
0.0004
0.0034
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
⋮
⋮
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
-0.0001
-0.0004
-0.0009
-0.0009
-0.0003
⋮
⋮
E = 5000x1
0.0000
0.0000
0.0002
0.0017
0.0000
0.0000
0.0000
0.0000
```

```

0.0000
0.0000
:
:
Iteration    22 | Cost: 3.138624e-02
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
0.0000
-0.0001
-0.0004
-0.0009
-0.0009
-0.0003
:
:
E = 5000x1
0.0000
0.0000
0.0002
0.0019
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
0.0000
-0.0001
-0.0003
-0.0010
-0.0009
-0.0003
:
:
E = 5000x1
0.0000
0.0000
0.0003
0.0024
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    23 | Cost: 3.012590e-02
theta = 401x1
    0
    0
    0

```

```

-0.0000
 0.0000
-0.0001
-0.0003
-0.0010
-0.0010
-0.0003
  ⋮
  ⋮
E = 5000×1
 0.0000
 0.0000
 0.0002
 0.0010
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  ⋮
  ⋮
Iteration    24 | Cost: 2.930241e-02
theta = 401×1
 0
 0
 0
-0.0000
 0.0000
-0.0001
-0.0003
-0.0014
-0.0011
-0.0002
  ⋮
  ⋮
E = 5000×1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0003
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  ⋮
  ⋮
theta = 401×1
 0
 0
 0
-0.0000
 0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
  ⋮
  ⋮
E = 5000×1

```

```

1.0e+00 *
  0.0000
  0.0000
  0.0001
  0.0007
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  :
  :
Iteration    25 | Cost: 2.893186e-02
theta = 401x1
    0
    0
    0
 -0.0000
  0.0000
 -0.0001
 -0.0003
 -0.0012
 -0.0010
 -0.0003
  :
  :
E = 5000x1
1.0e+00 *
  0.0000
  0.0000
  0.0001
  0.0009
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  :
  :
theta = 401x1
    0
    0
    0
 -0.0000
  0.0000
 -0.0001
 -0.0003
 -0.0012
 -0.0010
 -0.0003
  :
  :
E = 5000x1
  0.0000
  0.0000
  0.0002
  0.0012
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000

```

```

0.0000
:
:
Iteration    26 | Cost: 2.802474e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0013
-0.0011
-0.0003
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0009
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    27 | Cost: 2.666012e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0001
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000

```



```

    0.0000
    -0.0001
    -0.0003
    -0.0013
    -0.0010
    -0.0003
    :
    :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0001
    0.0007
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :
Iteration    28 | Cost: 2.654574e-02
theta = 401×1
    0
    0
    0
    -0.0000
    0.0000
    -0.0001
    -0.0003
    -0.0013
    -0.0010
    -0.0003
    :
    :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0001
    0.0008
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :
theta = 401×1
    0
    0
    0
    -0.0000
    0.0000
    -0.0001
    -0.0003
    -0.0012
    -0.0010
    -0.0003
    :
    :
E = 5000×1

```

```

1.0e+00 *
  0.0000
  0.0000
  0.0001
  0.0009
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  :
  :
theta = 401x1
      0
      0
      0
 -0.0000
  0.0000
 -0.0001
 -0.0003
 -0.0012
 -0.0010
 -0.0003
  :
  :
E = 5000x1
  0.0000
  0.0000
  0.0002
  0.0010
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  :
  :
Iteration      29 | Cost: 2.573053e-02
theta = 401x1
      0
      0
      0
 -0.0000
  0.0000
 -0.0001
 -0.0003
 -0.0012
 -0.0010
 -0.0003
  :
  :
E = 5000x1
1.0e+00 *
  0.0000
  0.0000
  0.0001
  0.0004
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000

```

```

0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0007
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    30 | Cost: 2.537199e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0004
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    31 | Cost: 2.517240e-02
theta = 401x1
0
0
0
-0.0000

```

```

0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0002
0.0008
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0001
0.0005
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    32 | Cost: 2.513433e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
:
:
E = 5000×1

```

```

1.0e+00 *
  0.0000
  0.0000
  0.0001
  0.0005
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  :
  :
theta = 401x1
      0
      0
      0
 -0.0000
  0.0000
 -0.0001
 -0.0003
 -0.0012
 -0.0010
 -0.0003
  :
  :
E = 5000x1
1.0e+00 *
  0.0000
  0.0000
  0.0001
  0.0006
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  :
  :
Iteration    33 | Cost: 2.503069e-02
theta = 401x1
      0
      0
      0
 -0.0000
  0.0000
 -0.0001
 -0.0003
 -0.0012
 -0.0010
 -0.0003
  :
  :
E = 5000x1
1.0e+00 *
  0.0000
  0.0000
  0.0001
  0.0006
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  :
  :

```

```

0.0000
0.0000
:
Iteration    34 | Cost: 2.494552e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
:
:
E = 5000x1
0.0000
0.0000
0.0002
0.0012
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0006
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    35 | Cost: 2.493218e-02
theta = 401x1
0
0
0
-0.0000

```

```

0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0001
0.0006
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0001
0.0006
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0012
-0.0010
-0.0003
:
:
E = 5000×1
1.0e+00 *

```

```

0.0000
0.0000
0.0001
0.0005
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    36 | Cost: 2.480206e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
     -0.0001
     -0.0003
     -0.0013
     -0.0010
     -0.0002
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0001
      0.0006
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
     -0.0001
     -0.0003
     -0.0013
     -0.0010
     -0.0002
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0001
      0.0007
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000

```



```

0.0000
:
:
Iteration    37 | Cost: 2.433128e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0013
-0.0010
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0005
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    38 | Cost: 2.390575e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0013
-0.0010
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0004
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    39 | Cost: 2.342359e-02
theta = 401x1
0
0
0

```

```

-0.0000
 0.0000
-0.0001
-0.0003
-0.0013
-0.0010
-0.0002
  :
  :
E = 5000×1
 0.0000
 0.0000
 0.0008
 0.0044
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  :
  :
theta = 401×1
      0
      0
      0
-0.0000
 0.0000
-0.0001
-0.0003
-0.0013
-0.0010
-0.0002
  :
  :
E = 5000×1
1.0e+00 *
 0.0000
 0.0000
 0.0001
 0.0006
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
  :
  :
theta = 401×1
      0
      0
      0
-0.0000
 0.0000
-0.0001
-0.0003
-0.0013
-0.0010
-0.0002
  :
  :
E = 5000×1
1.0e+00 *

```

```

0.0000
0.0000
0.0001
0.0005
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    40 | Cost: 2.341137e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
     -0.0001
     -0.0003
     -0.0013
     -0.0010
     -0.0002
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0001
      0.0005
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
     -0.0001
     -0.0003
     -0.0013
     -0.0010
     -0.0002
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0001
      0.0005
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000

```

```

0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0013
-0.0010
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0005
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    41 | Cost: 2.329299e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0013
-0.0010
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0005
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000

```

```

-0.0001
-0.0003
-0.0013
-0.0010
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0004
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    42 | Cost: 2.282886e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0014
-0.0010
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0004
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0014
-0.0010
-0.0002
:
:
E = 5000x1
1.0e+00 *

```

```

0.0000
0.0000
0.0001
0.0004
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    43 | Cost: 2.269501e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
     -0.0001
     -0.0003
     -0.0014
     -0.0010
     -0.0002
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0001
      0.0006
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
     -0.0001
     -0.0003
     -0.0014
     -0.0010
     -0.0002
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0001
      0.0005
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000

```

```

0.0000
:
:
Iteration    44 | Cost: 2.260572e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0014
-0.0010
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0005
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0014
-0.0011
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0001
0.0005
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    45 | Cost: 2.241169e-02
theta = 401x1
0
0
0
-0.0000

```

```

0.0000
-0.0001
-0.0003
-0.0014
-0.0011
-0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0003
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0014
-0.0011
-0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0005
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    46 | Cost: 2.236780e-02
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0014
-0.0011
-0.0002
:
:
E = 5000×1

```



```
1.0e+00 *
0.0000
0.0000
0.0000
0.0004
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
```

-
-
-

0
0
0

```
-0.0000
 0.0000
-0.0001
-0.0003
-0.0014
-0.0011
-0.0002
```

-
-
-

```
1.0e+00 *
  0.0000
  0.0000
  0.0000
  0.0004
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
```

•
•
•

0
0
0

```
-0.0000
 0.0000
-0.0001
-0.0003
-0.0014
-0.0011
-0.0002
```

-
-
-

```
1.0e+00 *
  0.0000
  0.0000
  0.0000
  0.0004
  0.0000
  0.0000
  0.0000
  0.0000
  0.0000
```

```

0.0000
:
:
Iteration    47 | Cost: 2.205723e-02
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0002
-0.0014
-0.0011
-0.0002
:
:
E = 5000x1
0.0000
0.0000
0.0002
0.0022
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0014
-0.0011
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0004
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    48 | Cost: 2.202553e-02
theta = 401x1
0
0
0
-0.0000
0.0000

```

```

-0.0001
-0.0003
-0.0014
-0.0011
-0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0001
0.0005
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0003
-0.0014
-0.0011
-0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0001
0.0006
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
-0.0001
-0.0002
-0.0014
-0.0011
-0.0002
:
:
E = 5000×1
1.0e+00 *
0.0000

```

```

0.0000
0.0001
0.0008
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      49 | Cost: 2.176954e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
     -0.0001
     -0.0002
     -0.0015
     -0.0011
     -0.0002
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0003
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
     -0.0001
     -0.0002
     -0.0014
     -0.0011
     -0.0002
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0007
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000

```

```

      :
      :
Iteration    50 | Cost: 2.172630e-02
theta = 401x1
      0
      0
      0
      0
      0
      0
      0
      0
      0
      0
      0
      :
      :
E = 5000x1
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      0.5000
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
     -0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
E = 5000x1
      0.1066
      0.0915
      0.0608
      0.0639
      0.0679
      0.0851
      0.0544
      0.2452
      0.0486
      0.0840
      :
      :
Iteration     1 | Cost: 3.142799e-01
theta = 401x1
      0
      0
      0
     -0.0000
     -0.0000
     -0.0000

```

```

0.0012
0.0016
0.0005
0.0000
:
:
E = 5000×1
0.0146
0.0160
0.0059
0.0057
0.0661
0.0704
0.0035
0.0242
0.0091
0.0117
:
:
Iteration      2 | Cost: 1.938915e-01
theta = 401×1
0
0
0
-0.0000
-0.0000
-0.0000
0.0018
0.0024
0.0007
0.0000
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0002
0.0000
0.0000
:
:
theta = 401×1
0
0
0
-0.0000
-0.0000
-0.0000
0.0015
0.0020
0.0006
0.0000
:
:
E = 5000×1
0.0002
0.0001
0.0000

```

[illegible]

```

theta = 401x1
    0
    0
    0
-0.0000
-0.0000
-0.0000
 0.0025
 0.0040
 0.0016
-0.0002
  :
  :
E = 5000x1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0001
 0.0000
 0.0000
  :
  :
Iteration      4 | Cost: 8.666461e-02
theta = 401x1
    0
    0
    0
-0.0000
-0.0000
 0.0000
 0.0027
 0.0056
 0.0012
-0.0014
  :
  :
E = 5000x1
1.0e+00 *
 0.0001
 0.0004
 0.0000
 0.0000
 0.0002
 0.0000
 0.0003
 0.0003
 0.0000
 0.0009
  :
  :
theta = 401x1
    0
    0
    0
-0.0000
-0.0000
-0.0000
 0.0026
 0.0049

```



```

    0.0013
    -0.0009
    :
E = 5000×1
1.0e+00 *
    0.0000
    0.0001
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0002
    0.0000
    0.0001
    :
    :
Iteration      5 | Cost: 6.518233e-02
theta = 401×1
    0
    0
    0
    -0.0000
    0.0000
    0.0000
    0.0027
    0.0059
    0.0009
    -0.0017
    :
    :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :
theta = 401×1
    0
    0
    0
    -0.0000
    -0.0000
    -0.0000
    0.0026
    0.0051
    0.0013
    -0.0010
    :
    :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.0001
:
:
Iteration      6 | Cost: 6.163782e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
0.0027
0.0051
0.0010
-0.0011
:
:
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0001
      0.0000
      0.0001
      :
      :
Iteration      7 | Cost: 5.886007e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
0.0027
0.0053
0.0007
-0.0013
:
:
E = 5000x1
1.0e+00 *
      0.0001
      0.0001
      0.0000
      0.0000
      0.0001
      0.0000
      0.0001
      0.0001
      0.0001
      0.0000
      0.0003

```

```

      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
      0.0027
      0.0052
      0.0009
     -0.0012
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0001
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0001
      0.0000
      0.0001
      :
      :
Iteration      8 | Cost: 5.773973e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
      0.0027
      0.0054
      0.0008
     -0.0013
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0001
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0001
      0.0000
      0.0001
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000

```

```

0.0027
0.0056
0.0005
-0.0015
:
:
E = 5000x1
1.0e+00 *
0.0001
0.0001
0.0000
0.0000
0.0000
0.0000
0.0001
0.0001
0.0000
0.0002
:
:
Iteration      9 | Cost: 5.334455e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
0.0028
0.0061
0.0004
-0.0016
:
:
E = 5000x1
1.0e+00 *
0.0002
0.0002
0.0000
0.0000
0.0001
0.0000
0.0006
0.0001
0.0001
0.0007
:
:
Iteration     10 | Cost: 5.036396e-02
theta = 401x1
0
0
0
-0.0000
0.0001
0.0001
0.0028
0.0070
0.0001
-0.0018
:
:
E = 5000x1
1.0e+00 *

```

```

0.0001
0.0001
0.0000
0.0000
0.0000
0.0000
0.0000
0.0008
0.0000
0.0000
0.0004
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
0.0028
0.0062
0.0003
-0.0016
:
:
E = 5000x1
1.0e+00 *
0.0002
0.0002
0.0000
0.0000
0.0001
0.0000
0.0006
0.0001
0.0001
0.0007
:
:
Iteration    11 | Cost: 4.994868e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
0.0028
0.0062
0.0003
-0.0016
:
:
E = 5000x1
1.0e+00 *
0.0001
0.0001
0.0000
0.0000
0.0001
0.0000
0.0004
0.0001
0.0000

```

```

0.0005
:
:
Iteration    12 | Cost: 4.964157e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
0.0028
0.0063
0.0003
-0.0016
:
:
E = 5000x1
1.0e+00 *
0.0002
0.0002
0.0000
0.0000
0.0001
0.0000
0.0005
0.0001
0.0000
0.0006
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
0.0028
0.0063
0.0003
-0.0016
:
:
E = 5000x1
1.0e+00 *
0.0002
0.0002
0.0000
0.0000
0.0001
0.0000
0.0004
0.0001
0.0000
0.0005
:
:
Iteration    13 | Cost: 4.945483e-02
theta = 401x1
0
0
0
-0.0000

```

```

0.0000
0.0001
0.0028
0.0065
0.0003
-0.0016
:
:
E = 5000×1
1.0e+00 *
0.0002
0.0001
0.0000
0.0000
0.0001
0.0000
0.0004
0.0000
0.0000
0.0005
:
:
Iteration    14 | Cost: 4.920530e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
0.0028
0.0066
0.0003
-0.0016
:
:
E = 5000×1
1.0e+00 *
0.0002
0.0002
0.0000
0.0000
0.0001
0.0000
0.0005
0.0000
0.0000
0.0005
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
0.0028
0.0068
0.0002
-0.0016
:
:
E = 5000×1

```

```

1.0e+00 *
  0.0002
  0.0002
  0.0000
  0.0000
  0.0001
  0.0000
  0.0006
  0.0000
  0.0000
  0.0006
  :
  :
Iteration    15 | Cost: 4.880147e-02
theta = 401x1
    0
    0
    0
 -0.0000
  0.0001
  0.0001
  0.0028
  0.0074
  0.0001
 -0.0015
  :
  :
E = 5000x1
1.0e+00 *
  0.0003
  0.0002
  0.0000
  0.0000
  0.0001
  0.0000
  0.0008
  0.0000
  0.0001
  0.0007
  :
  :
theta = 401x1
    0
    0
    0
 -0.0000
  0.0001
  0.0001
  0.0029
  0.0085
 -0.0001
 -0.0015
  :
  :
E = 5000x1
  0.0004
  0.0004
  0.0000
  0.0001
  0.0001
  0.0000
  0.0012
  0.0000
  0.0001

```



```

0.0008
:
:
Iteration    16 | Cost: 4.766125e-02
theta = 401x1
0
0
0
-0.0000
0.0001
0.0001
0.0029
0.0093
-0.0002
-0.0014
:
:
E = 5000x1
1.0e+00 *
0.0003
0.0003
0.0000
0.0000
0.0000
0.0000
0.0000
0.0008
0.0000
0.0000
0.0005
:
:
Iteration    17 | Cost: 4.683578e-02
theta = 401x1
0
0
0
-0.0000
0.0001
0.0002
0.0030
0.0115
-0.0006
-0.0013
:
:
E = 5000x1
0.0002
0.0002
0.0000
0.0000
0.0000
0.0000
0.0010
0.0000
0.0000
0.0004
:
:
Iteration    18 | Cost: 4.573370e-02
theta = 401x1
0
0
0
-0.0000

```

```

0.0001
0.0002
0.0030
0.0121
-0.0007
-0.0012
:
:
E = 5000×1
0.0003
0.0004
0.0000
0.0000
0.0000
0.0000
0.0020
0.0000
0.0001
0.0006
:
:
Iteration    19 | Cost: 4.507942e-02
theta = 401×1
0
0
0
-0.0000
0.0002
0.0004
0.0033
0.0177
-0.0016
-0.0008
:
:
E = 5000×1
0.0002
0.0002
0.0000
0.0000
0.0000
0.0000
0.0035
0.0000
0.0003
0.0005
:
:
theta = 401×1
0
0
0
-0.0000
0.0001
0.0002
0.0031
0.0127
-0.0008
-0.0012
:
:
E = 5000×1
0.0003
0.0004

```

```

0.0000
0.0000
0.0000
0.0000
0.0021
0.0000
0.0001
0.0006
:
:
theta = 401x1
0
0
0
-0.0000
0.0001
0.0002
0.0031
0.0124
-0.0007
-0.0012
:
:
E = 5000x1
0.0003
0.0004
0.0000
0.0000
0.0000
0.0000
0.0020
0.0000
0.0001
0.0006
:
:
Iteration    20 | Cost: 4.501869e-02
theta = 401x1
0
0
0
-0.0000
0.0001
0.0002
0.0031
0.0124
-0.0007
-0.0012
:
:
E = 5000x1
0.0003
0.0004
0.0000
0.0000
0.0000
0.0000
0.0019
0.0000
0.0001
0.0005
:
:
theta = 401x1

```

```

0
0
0
-0.0000
0.0001
0.0002
0.0031
0.0124
-0.0007
-0.0012
:
:
E = 5000×1
0.0003
0.0003
0.0000
0.0000
0.0000
0.0000
0.0018
0.0000
0.0001
0.0005
:
:
theta = 401×1
0
0
0
-0.0000
0.0001
0.0002
0.0031
0.0125
-0.0007
-0.0012
:
:
E = 5000×1
0.0002
0.0003
0.0000
0.0000
0.0000
0.0000
0.0013
0.0000
0.0001
0.0004
:
:
Iteration    21 | Cost: 4.433528e-02
theta = 401×1
0
0
0
-0.0000
0.0001
0.0002
0.0031
0.0126
-0.0007
-0.0012

```

```

      :
      :
E = 5000×1
1.0e+00 *
    0.0002
    0.0002
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0008
    0.0000
    0.0000
    0.0000
    0.0003
    :
    :

```

```

theta = 401×1
      0
      0
      0
    -0.0000
     0.0001
     0.0002
     0.0031
     0.0126
    -0.0007
    -0.0012
      :
      :

```

```

E = 5000×1
1.0e+00 *
    0.0001
    0.0001
    0.0000
    0.0000
    0.0000
    0.0000
    0.0003
    0.0000
    0.0000
    0.0002
    :
    :

```

```

Iteration    22 | Cost: 4.271154e-02
theta = 401×1

```

```

      0
      0
      0
    -0.0000
     0.0001
     0.0002
     0.0031
     0.0130
    -0.0008
    -0.0012
      :
      :

```

```

E = 5000×1
1.0e+00 *
    0.0001
    0.0002
    0.0000
    0.0001
    0.0000

```

```

0.0000
0.0008
0.0000
0.0002
0.0006
:
:
theta = 401x1
0
0
0
-0.0000
0.0001
0.0002
0.0031
0.0127
-0.0007
-0.0012
:
:
E = 5000x1
1.0e+00 *
0.0001
0.0001
0.0000
0.0000
0.0000
0.0000
0.0004
0.0000
0.0000
0.0002
:
:
Iteration    23 | Cost: 4.251498e-02
theta = 401x1
0
0
0
-0.0000
0.0001
0.0002
0.0031
0.0128
-0.0008
-0.0012
:
:
E = 5000x1
1.0e+00 *
0.0001
0.0001
0.0000
0.0000
0.0000
0.0000
0.0003
0.0000
0.0000
0.0002
:
:
theta = 401x1
0

```

```

0
0
-0.0000
0.0001
0.0002
0.0031
0.0129
-0.0008
-0.0012
:
:
E = 5000×1
1.0e+00 *
0.0001
0.0001
0.0000
0.0000
0.0000
0.0000
0.0000
0.0003
0.0000
0.0000
0.0002
:
:
Iteration    24 | Cost: 4.191880e-02
theta = 401×1
0
0
0
-0.0000
0.0001
0.0003
0.0032
0.0139
-0.0008
-0.0011
:
:
E = 5000×1
1.0e+00 *
0.0001
0.0001
0.0000
0.0000
0.0000
0.0000
0.0003
0.0000
0.0001
0.0003
:
:
theta = 401×1
0
0
0
-0.0000
0.0001
0.0002
0.0031
0.0132
-0.0008
-0.0011

```

```

      :
      :
E = 5000×1
1.0e+00 *
    0.0001
    0.0001
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0003
    0.0000
    0.0000
    0.0002
      :
      :
Iteration    25 | Cost: 4.178634e-02
theta = 401×1
      0
      0
      0
    -0.0000
    0.0001
    0.0003
    0.0032
    0.0135
    -0.0008
    -0.0011
      :
      :
E = 5000×1
1.0e+00 *
    0.0001
    0.0001
    0.0000
    0.0000
    0.0000
    0.0000
    0.0002
    0.0000
    0.0000
    0.0002
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
    0.0001
    0.0003
    0.0032
    0.0139
    -0.0008
    -0.0011
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0001
    0.0000
    0.0000
    0.0000

```



```

0.0000
0.0002
0.0000
0.0000
0.0002
:
:
Iteration    26 | Cost: 4.147292e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0001
0.0003
0.0032
0.0140
-0.0008
-0.0011
:
:
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0001
      0.0000
      0.0000
      0.0001
      :
      :
theta = 401x1
      0
      0
      0
-0.0000
0.0001
0.0003
0.0032
0.0139
-0.0008
-0.0011
:
:
E = 5000x1
1.0e+00 *
      0.0000
      0.0001
      0.0000
      0.0000
      0.0000
      0.0000
      0.0001
      0.0000
      0.0000
      0.0002
      :
      :
Iteration    27 | Cost: 4.139877e-02
theta = 401x1

```

```

0
0
0
-0.0000
0.0001
0.0003
0.0032
0.0140
-0.0008
-0.0011
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.0000
0.0001
:
:
theta = 401x1
0
0
0
-0.0000
0.0001
0.0003
0.0032
0.0140
-0.0008
-0.0010
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.0000
0.0001
:
:
Iteration    28 | Cost: 4.119548e-02
theta = 401x1
0
0
0
-0.0000
0.0001
0.0003
0.0033
0.0147
-0.0008

```

```

-0.0010
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.0000
0.0001
:
theta = 401×1
0
0
0
-0.0000
0.0001
0.0003
0.0034
0.0161
-0.0009
-0.0010
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.0000
0.0001
:
Iteration    29 | Cost: 4.051789e-02
theta = 401×1
0
0
0
-0.0000
0.0001
0.0004
0.0035
0.0180
-0.0009
-0.0009
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0001
0.0003
0.0034
0.0165
-0.0009
-0.0010
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.0000
0.0001
:
:
Iteration    30 | Cost: 4.039230e-02
theta = 401x1
0
0
0
-0.0000
0.0001
0.0003
0.0035
0.0172
-0.0009
-0.0010
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.0000
0.0001
:
:
theta = 401x1

```

```

0
0
0
-0.0000
0.0001
0.0004
0.0036
0.0187
-0.0009
-0.0009
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.0000
0.0000
0.0001
:
:
Iteration    31 | Cost: 3.980265e-02
theta = 401x1
0
0
0
-0.0000
0.0002
0.0004
0.0036
0.0196
-0.0009
-0.0009
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.0000
0.0000
0.0001
:
:
theta = 401x1
0
0
0
-0.0000
0.0001
0.0004
0.0036
0.0192
-0.0009

```

```

-0.0009
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.0000
0.0001
:
:
Iteration 32 | Cost: 3.956674e-02
theta = 401x1
0
0
0
-0.0000
0.0002
0.0004
0.0037
0.0204
-0.0009
-0.0009
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0001
0.0000
0.0000
0.0000
0.0001
:
:
theta = 401x1
0
0
0
-0.0000
0.0002
0.0005
0.0038
0.0227
-0.0009
-0.0009
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      33 | Cost: 3.884213e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0002
0.0005
0.0040
0.0253
-0.0010
-0.0009
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      34 | Cost: 3.804678e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0002
0.0005
0.0040
0.0251
-0.0009
-0.0010
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:

```

Iteration 35 | Cost: 3.769436e-02

theta = 401x1

0
0
0

-0.0000
0.0002
0.0005
0.0039
0.0247
-0.0008
-0.0010

⋮

E = 5000x1

1.0e+00 *

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

⋮

theta = 401x1

0
0
0

-0.0000
0.0002
0.0005
0.0040
0.0250
-0.0009
-0.0010

⋮

E = 5000x1

1.0e+00 *

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

⋮

Iteration 36 | Cost: 3.759935e-02

theta = 401x1

0
0
0

-0.0000
0.0002
0.0005
0.0040


```

    0.0251
    -0.0009
    -0.0010
    :
    :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :
Iteration    37 | Cost: 3.746186e-02
theta = 401×1
    0
    0
    0
    -0.0000
    0.0002
    0.0005
    0.0040
    0.0252
    -0.0009
    -0.0010
    :
    :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    :
    :
theta = 401×1
    0
    0
    0
    -0.0000
    0.0002
    0.0005
    0.0040
    0.0253
    -0.0008
    -0.0010
    :
    :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      38 | Cost: 3.724333e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0002
0.0005
0.0040
0.0257
-0.0007
-0.0010
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
      0
      0
      0
-0.0000
0.0002
0.0005
0.0040
0.0255
-0.0008
-0.0010
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000

```

```

      :
      :
Iteration    39 | Cost: 3.716876e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0002
      0.0005
      0.0040
      0.0258
     -0.0007
     -0.0010
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0002
      0.0005
      0.0040
      0.0262
     -0.0006
     -0.0011
      :
      :
E = 5000x1
1.0e+00 *
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      0.0000
      :
      :
Iteration    40 | Cost: 3.699598e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0002

```

```

0.0005
0.0040
0.0273
-0.0004
-0.0012
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    41 | Cost: 3.687935e-02
theta = 401x1
0
0
0
-0.0000
0.0002
0.0005
0.0041
0.0291
-0.0001
-0.0013
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0002
0.0005
0.0040
0.0276
-0.0004
-0.0012
:
:
E = 5000x1
1.0e+00 *

```

```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration      42 | Cost: 3.684527e-02
theta = 401x1
    0
    0
    0
-0.0000
0.0002
0.0005
0.0040
0.0276
-0.0004
-0.0012
:
:
E = 5000x1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
:
:
Iteration      43 | Cost: 3.679918e-02
theta = 401x1
    0
    0
    0
-0.0000
0.0002
0.0005
0.0040
0.0276
-0.0004
-0.0012
:
:
E = 5000x1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000

```

```

0.0000
0.0000
:
Iteration    44 | Cost: 3.675423e-02
theta = 401x1
      0
      0
      0
-0.0000
 0.0002
 0.0005
 0.0040
 0.0276
-0.0004
-0.0012
      :
      :
E = 5000x1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
      :
      :
Iteration    45 | Cost: 3.670707e-02
theta = 401x1
      0
      0
      0
-0.0000
 0.0002
 0.0005
 0.0041
 0.0278
-0.0004
-0.0012
      :
      :
E = 5000x1
1.0e+00 *
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
 0.0000
      :
      :
Iteration    46 | Cost: 3.665694e-02
theta = 401x1
      0
      0

```

```

0
-0.0000
0.0002
0.0005
0.0041
0.0280
-0.0003
-0.0012
:
:
E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:

```

```

theta = 401×1
0
0
0
-0.0000
0.0002
0.0005
0.0041
0.0282
-0.0003
-0.0012
:
:

```

```

E = 5000×1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:

```

```

Iteration 47 | Cost: 3.658317e-02

```

```

theta = 401×1
0
0
0
-0.0000
0.0002
0.0006
0.0041
0.0290
-0.0002
-0.0013

```

```

      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
Iteration    48 | Cost: 3.654202e-02
theta = 401×1
      0
      0
      0
    -0.0000
     0.0002
     0.0006
     0.0041
     0.0294
    -0.0001
    -0.0013
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
Iteration    49 | Cost: 3.650263e-02
theta = 401×1
      0
      0
      0
    -0.0000
     0.0002
     0.0006
     0.0042
     0.0307
     0.0001
    -0.0014
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000

```



```

0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0002
0.0006
0.0041
0.0301
0.0000
-0.0013
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
Iteration    50 | Cost: 3.646223e-02
theta = 401x1
0
0
0
0
0
0
0
0
0
0
0
:
:
E = 5000x1
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
:
:
theta = 401x1
1.0e+00 *

```

```

0
0
0
-0.0000
0.0000
0.0000
-0.0000
-0.0000
-0.0000
-0.0000
:
:
E = 5000×1
0.0971
0.0807
0.0568
0.0566
0.0591
0.0758
0.0486
0.2462
0.0435
0.0765
:
:
Iteration      1 | Cost: 3.693354e-01
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0006
-0.0006
-0.0003
:
:
E = 5000×1
0.0095
0.0011
0.6206
0.0046
0.0434
0.0906
0.0164
0.6882
0.1876
0.0365
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0002
-0.0003
-0.0003

```

```

-0.0001
:
E = 5000×1
0.0371
0.0137
0.1966
0.0197
0.0519
0.0818
0.0308
0.4238
0.0831
0.0561
:
Iteration      2 | Cost: 2.565067e-01
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0006
-0.0006
-0.0002
:
E = 5000×1
0.0002
0.0000
0.0046
0.0000
0.0002
0.0011
0.0001
0.1498
0.0006
0.0003
:
Iteration      3 | Cost: 2.370476e-01
theta = 401×1
0
0
0
-0.0000
0.0001
0.0001
-0.0024
-0.0042
-0.0043
-0.0017
:
E = 5000×1
0.0000
0.0000
0.0040
0.0000
0.0000

```

```

0.0000
0.0000
0.5970
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0014
-0.0024
-0.0024
-0.0010
:
:
E = 5000x1
0.0000
0.0000
0.0043
0.0000
0.0000
0.0000
0.0000
0.0000
0.3381
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0009
-0.0015
-0.0015
-0.0006
:
:
E = 5000x1
0.0000
0.0000
0.0044
0.0000
0.0000
0.0001
0.0000
0.2307
0.0001
0.0000
:
:
theta = 401x1
1.0e+00 *
0
0
0

```

```

-0.0000
 0.0000
 0.0000
-0.0005
-0.0008
-0.0008
-0.0003
  ⋮
  ⋮
E = 5000×1
 0.0000
 0.0000
 0.0045
 0.0000
 0.0001
 0.0007
 0.0000
 0.1646
 0.0004
 0.0001
  ⋮
  ⋮
Iteration      4 | Cost: 2.341589e-01
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0005
-0.0008
-0.0008
-0.0003
  ⋮
  ⋮
E = 5000×1
 0.0001
 0.0000
 0.0089
 0.0000
 0.0002
 0.0015
 0.0000
 0.2030
 0.0009
 0.0001
  ⋮
  ⋮
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0004
-0.0007
-0.0007
-0.0003
  ⋮
  ⋮

```

```

E = 5000×1
  0.0003
  0.0000
  0.0334
  0.0001
  0.0007
  0.0062
  0.0002
  0.2986
  0.0045
  0.0006
  ⋮
Iteration      5 | Cost: 2.103654e-01
theta = 401×1
1.0e+00 *
    0
    0
    0
 -0.0000
  0.0000
  0.0000
 -0.0004
 -0.0007
 -0.0007
 -0.0003
  ⋮
E = 5000×1
  0.0008
  0.0001
  0.0766
  0.0005
  0.0018
  0.0343
  0.0006
  0.3315
  0.0207
  0.0013
  ⋮
Iteration      6 | Cost: 1.781526e-01
theta = 401×1
1.0e+00 *
    0
    0
    0
 -0.0000
  0.0000
  0.0000
 -0.0004
 -0.0007
 -0.0007
 -0.0002
  ⋮
E = 5000×1
  0.0003
  0.0000
  0.0167
  0.0001
  0.0004
  0.0128
  0.0001

```

```

0.1906
0.0045
0.0003
:
:
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0007
-0.0007
-0.0002
:
:
E = 5000x1
0.0004
0.0000
0.0333
0.0002
0.0007
0.0199
0.0003
0.2471
0.0089
0.0006
:
:
Iteration      7 | Cost: 1.659830e-01
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0007
-0.0008
-0.0002
:
:
E = 5000x1
0.0005
0.0000
0.0523
0.0007
0.0006
0.0626
0.0004
0.2470
0.0175
0.0005
:
:
Iteration      8 | Cost: 1.523508e-01
theta = 401x1
1.0e+00 *
0

```

```

0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0008
-0.0009
-0.0002
:
:
E = 5000×1
0.0031
0.0005
0.5023
0.0124
0.0072
0.4759
0.0072
0.6241
0.2618
0.0056
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0007
-0.0008
-0.0002
:
:
E = 5000×1
0.0006
0.0001
0.0730
0.0010
0.0008
0.0841
0.0005
0.2856
0.0250
0.0006
:
:
Iteration      9 | Cost: 1.506519e-01
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0007
-0.0008
-0.0002

```



```

      :
      :
E = 5000×1
    0.0006
    0.0001
    0.0727
    0.0010
    0.0008
    0.0848
    0.0005
    0.2985
    0.0245
    0.0006
    :
    :

```

```

theta = 401×1
1.0e+00 *
      0
      0
      0
    -0.0000
     0.0000
     0.0000
    -0.0003
    -0.0007
    -0.0008
    -0.0002
      :
      :

```

```

E = 5000×1
    0.0005
    0.0001
    0.0721
    0.0010
    0.0008
    0.0864
    0.0005
    0.3252
    0.0234
    0.0007
    :
    :

```

```

theta = 401×1
1.0e+00 *
      0
      0
      0
    -0.0000
     0.0000
     0.0000
    -0.0003
    -0.0008
    -0.0009
    -0.0002
      :
      :

```

```

E = 5000×1
    0.0005
    0.0001
    0.0706
    0.0012
    0.0007
    0.0905
    0.0006

```

```

0.3972
0.0209
0.0007
:
:
Iteration    10 | Cost: 1.400809e-01
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0003
-0.0011
-0.0012
-0.0002
:
:
E = 5000x1
0.0028
0.0008
0.6048
0.0259
0.0074
0.5996
0.0149
0.7838
0.3297
0.0083
:
:
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0003
-0.0009
-0.0009
-0.0002
:
:
E = 5000x1
0.0006
0.0001
0.1030
0.0018
0.0009
0.1262
0.0009
0.4543
0.0318
0.0010
:
:
Iteration    11 | Cost: 1.383318e-01
theta = 401x1
1.0e+00 *
      0
      0

```

```

0
-0.0000
0.0000
0.0000
-0.0003
-0.0009
-0.0010
-0.0002
:
:
E = 5000×1
0.0006
0.0001
0.1061
0.0019
0.0009
0.1287
0.0009
0.4385
0.0339
0.0010
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0010
-0.0011
-0.0002
:
:
E = 5000×1
0.0006
0.0001
0.1127
0.0020
0.0009
0.1338
0.0010
0.4073
0.0385
0.0009
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0012
-0.0014
-0.0002
:
:
E = 5000×1
0.0004

```

```

0.0001
0.1344
0.0023
0.0008
0.1504
0.0012
0.3187
0.0560
0.0008
:
:
Iteration    12 | Cost: 1.229135e-01
theta = 401x1
    0
    0
    0
-0.0000
0.0000
0.0000
-0.0004
-0.0017
-0.0019
-0.0002
:
:
E = 5000x1
0.0019
0.0002
0.8052
0.0326
0.0050
0.5996
0.0219
0.3123
0.6575
0.0050
:
:
theta = 401x1
    0
    0
    0
-0.0000
0.0000
0.0000
-0.0003
-0.0013
-0.0014
-0.0002
:
:
E = 5000x1
0.0005
0.0001
0.1983
0.0033
0.0010
0.1933
0.0019
0.3178
0.0886
0.0010
:
:

```

Iteration 13 | Cost: 1.205599e-01

theta = 401x1

0
0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0014
-0.0015
-0.0002
:
:

E = 5000x1

0.0004
0.0001
0.1904
0.0028
0.0006
0.1431
0.0015
0.2304
0.0747
0.0007
:
:

theta = 401x1

0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0015
-0.0017
-0.0002
:
:

E = 5000x1

0.0002
0.0000
0.1753
0.0019
0.0002
0.0750
0.0009
0.1101
0.0527
0.0004
:
:

Iteration 14 | Cost: 1.123879e-01

theta = 401x1

0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0016
-0.0018

```

-0.0002
:
E = 5000×1
0.0000
0.0000
0.0178
0.0002
0.0001
0.0259
0.0001
0.0727
0.0080
0.0001
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0016
-0.0017
-0.0002
:
:
E = 5000×1
0.0002
0.0000
0.1023
0.0010
0.0002
0.0576
0.0005
0.0993
0.0330
0.0003
:
:
Iteration    15 | Cost: 1.110733e-01
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0016
-0.0017
-0.0002
:
:
E = 5000×1
0.0001
0.0000
0.0826
0.0007
0.0002
0.0648
0.0005

```

```

0.1064
0.0325
0.0002
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0017
-0.0018
-0.0002
:
:
E = 5000x1
0.0001
0.0000
0.0607
0.0005
0.0002
0.0764
0.0004
0.1172
0.0318
0.0002
:
:
Iteration 16 | Cost: 1.073286e-01
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0016
-0.0018
-0.0002
:
:
E = 5000x1
0.0007
0.0001
0.4358
0.0055
0.0010
0.2170
0.0047
0.1108
0.1870
0.0012
:
:
theta = 401x1
0
0
0
-0.0000
0.0000

```

```

    0.0000
    -0.0004
    -0.0017
    -0.0018
    -0.0002
    :
    :
E = 5000×1
    0.0001
    0.0000
    0.0765
    0.0006
    0.0002
    0.0854
    0.0006
    0.1166
    0.0384
    0.0002
    :
    :
Iteration    17 | Cost: 1.068798e-01
theta = 401×1
    0
    0
    0
    -0.0000
    0.0000
    0.0000
    -0.0004
    -0.0017
    -0.0018
    -0.0002
    :
    :
E = 5000×1
    0.0001
    0.0000
    0.0763
    0.0006
    0.0002
    0.0780
    0.0006
    0.1014
    0.0354
    0.0002
    :
    :
theta = 401×1
    0
    0
    0
    -0.0000
    0.0000
    0.0000
    -0.0004
    -0.0017
    -0.0018
    -0.0002
    :
    :
E = 5000×1
    0.0001
    0.0000
    0.0760

```



```

0.0006
0.0002
0.0677
0.0006
0.0813
0.0313
0.0002
:
:
Iteration    18 | Cost: 1.058981e-01
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0004
-0.0017
-0.0018
-0.0002
:
:
E = 5000x1
0.0003
0.0000
0.1490
0.0014
0.0004
0.0921
0.0014
0.0607
0.0534
0.0004
:
:
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0004
-0.0017
-0.0018
-0.0002
:
:
E = 5000x1
0.0002
0.0000
0.0872
0.0007
0.0002
0.0720
0.0007
0.0767
0.0348
0.0002
:
:
Iteration    19 | Cost: 1.056835e-01
theta = 401x1

```

```

0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0017
-0.0018
-0.0002
:
:
E = 5000×1
0.0002
0.0000
0.0844
0.0007
0.0002
0.0724
0.0007
0.0738
0.0346
0.0002
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0017
-0.0018
-0.0002
:
:
E = 5000×1
0.0002
0.0000
0.0791
0.0007
0.0002
0.0732
0.0008
0.0683
0.0344
0.0003
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0018
-0.0020
-0.0002
:
:

```

```

E = 5000×1
  0.0002
  0.0000
  0.0649
  0.0006
  0.0003
  0.0758
  0.0011
  0.0541
  0.0335
  0.0003
  ⋮
theta = 401×1
    0
    0
    0
 -0.0000
  0.0000
  0.0000
 -0.0004
 -0.0020
 -0.0021
 -0.0002
  ⋮
  ⋮
E = 5000×1
  0.0001
  0.0000
  0.0460
  0.0005
  0.0004
  0.0804
  0.0018
  0.0360
  0.0320
  0.0003
  ⋮
  ⋮
Iteration    20 | Cost: 1.019768e-01
theta = 401×1
    0
    0
    0
 -0.0000
  0.0000
  0.0000
 -0.0004
 -0.0024
 -0.0025
 -0.0001
  ⋮
  ⋮
E = 5000×1
  0.0003
  0.0000
  0.0833
  0.0009
  0.0023
  0.2134
  0.0181
  0.0272
  0.1023
  0.0014

```

```

      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0004
     -0.0021
     -0.0022
     -0.0001
      :
      :
E = 5000x1
      0.0002
      0.0000
      0.0526
      0.0005
      0.0006
      0.1011
      0.0030
      0.0338
      0.0418
      0.0005
      :
      :
Iteration    21 | Cost: 1.010370e-01
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0004
     -0.0022
     -0.0022
     -0.0001
      :
      :
E = 5000x1
      0.0002
      0.0000
      0.0530
      0.0005
      0.0005
      0.0899
      0.0030
      0.0327
      0.0375
      0.0005
      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0004
     -0.0022

```

```

-0.0023
-0.0001
:
E = 5000×1
0.0002
0.0000
0.0536
0.0005
0.0004
0.0708
0.0029
0.0305
0.0301
0.0004
:
Iteration 22 | Cost: 9.828022e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0025
-0.0025
-0.0001
:
E = 5000×1
0.0000
0.0000
0.0076
0.0001
0.0001
0.0161
0.0003
0.0163
0.0043
0.0001
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0023
-0.0023
-0.0001
:
E = 5000×1
0.0001
0.0000
0.0444
0.0004
0.0004
0.0613

```

```

0.0023
0.0287
0.0248
0.0004
:
:
Iteration    23 | Cost: 9.812436e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0004
-0.0023
-0.0024
-0.0001
:
:
E = 5000x1
0.0001
0.0000
0.0374
0.0003
0.0003
0.0574
0.0018
0.0284
0.0224
0.0003
:
:
Iteration    24 | Cost: 9.792314e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0004
-0.0023
-0.0024
-0.0001
:
:
E = 5000x1
0.0001
0.0000
0.0396
0.0004
0.0004
0.0615
0.0019
0.0295
0.0244
0.0003
:
:
theta = 401x1
      0
      0
      0

```

```

-0.0000
 0.0000
 0.0000
-0.0004
-0.0024
-0.0024
-0.0001
  :
  :
E = 5000×1
 0.0001
 0.0000
 0.0445
 0.0004
 0.0004
 0.0707
 0.0020
 0.0319
 0.0291
 0.0003
  :
  :
Iteration    25 | Cost: 9.689705e-02
theta = 401×1
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0004
-0.0022
-0.0023
-0.0001
  :
  :
E = 5000×1
 0.0004
 0.0000
 0.1986
 0.0021
 0.0010
 0.1456
 0.0110
 0.0271
 0.0958
 0.0012
  :
  :
theta = 401×1
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0004
-0.0024
-0.0024
-0.0001
  :
  :
E = 5000×1
 0.0001

```

```

0.0000
0.0522
0.0005
0.0004
0.0762
0.0024
0.0314
0.0329
0.0004
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0024
-0.0024
-0.0001
:
:
E = 5000x1
0.0001
0.0000
0.0471
0.0004
0.0004
0.0726
0.0022
0.0318
0.0304
0.0003
:
:
Iteration    26 | Cost: 9.686948e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0024
-0.0024
-0.0001
:
:
E = 5000x1
0.0001
0.0000
0.0476
0.0004
0.0004
0.0732
0.0022
0.0316
0.0308
0.0003
:
:

```



```

theta = 401×1
    0
    0
    0
-0.0000
 0.0000
 0.0000
-0.0004
-0.0024
-0.0024
-0.0001
    ⋮

```

```

E = 5000×1
 0.0001
 0.0000
 0.0486
 0.0004
 0.0004
 0.0743
 0.0022
 0.0312
 0.0315
 0.0003
    ⋮

```

```

theta = 401×1
    0
    0
    0
-0.0000
 0.0000
 0.0000
-0.0004
-0.0024
-0.0025
-0.0001
    ⋮

```

```

E = 5000×1
 0.0001
 0.0000
 0.0517
 0.0004
 0.0004
 0.0776
 0.0022
 0.0302
 0.0340
 0.0003
    ⋮

```

```

theta = 401×1
    0
    0
    0
-0.0000
 0.0000
 0.0000
-0.0004
-0.0025
-0.0025
-0.0001

```

```

      :
      :
E = 5000×1
    0.0001
    0.0000
    0.0583
    0.0005
    0.0004
    0.0846
    0.0023
    0.0283
    0.0392
    0.0003
      :
      :
Iteration    27 | Cost: 9.630516e-02
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
     0.0000
    -0.0004
    -0.0026
    -0.0026
    -0.0001
      :
      :
E = 5000×1
    0.0001
    0.0000
    0.0500
    0.0004
    0.0003
    0.0713
    0.0016
    0.0213
    0.0331
    0.0002
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
     0.0000
    -0.0004
    -0.0026
    -0.0026
    -0.0001
      :
      :
E = 5000×1
    0.0001
    0.0000
    0.0529
    0.0004
    0.0004
    0.0759
    0.0018
    0.0236

```

```

0.0352
0.0002
:
Iteration    28 | Cost: 9.595524e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0027
-0.0027
-0.0001
:
:
E = 5000x1
0.0001
0.0000
0.0575
0.0004
0.0003
0.0728
0.0016
0.0219
0.0352
0.0002
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0004
-0.0029
-0.0029
-0.0001
:
:
E = 5000x1
0.0001
0.0000
0.0678
0.0004
0.0002
0.0669
0.0014
0.0189
0.0353
0.0002
:
:
Iteration    29 | Cost: 9.439663e-02
theta = 401x1
0
0
0
-0.0000
0.0000

```

```

0.0001
-0.0004
-0.0031
-0.0031
-0.0000
:
:
E = 5000×1
0.0001
0.0000
0.0460
0.0003
0.0002
0.0699
0.0012
0.0233
0.0315
0.0001
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0004
-0.0030
-0.0030
-0.0000
:
:
E = 5000×1
0.0001
0.0000
0.0554
0.0004
0.0002
0.0685
0.0013
0.0211
0.0333
0.0001
:
:
Iteration    30 | Cost: 9.385265e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0004
-0.0032
-0.0031
-0.0000
:
:
E = 5000×1
0.0001
0.0000
0.0605

```

```

0.0004
0.0003
0.0945
0.0017
0.0282
0.0454
0.0002
:
:
Iteration    31 | Cost: 9.343079e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0001
-0.0004
-0.0034
-0.0033
-0.0000
:
:
E = 5000x1
0.0001
0.0000
0.0675
0.0004
0.0003
0.0921
0.0019
0.0243
0.0474
0.0002
:
:
Iteration    32 | Cost: 9.268395e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0001
-0.0004
-0.0035
-0.0034
0.0000
:
:
E = 5000x1
0.0001
0.0000
0.0547
0.0003
0.0002
0.0715
0.0016
0.0192
0.0358
0.0001
:
:
Iteration    33 | Cost: 9.194399e-02

```

```

theta = 401x1
    0
    0
    0
-0.0000
0.0000
0.0001
-0.0004
-0.0036
-0.0035
0.0000
    :
    :
E = 5000x1
0.0001
0.0000
0.0564
0.0003
0.0002
0.0692
0.0017
0.0147
0.0375
0.0001
    :
    :
Iteration    34 | Cost: 9.122540e-02
theta = 401x1
    0
    0
    0
-0.0000
0.0000
0.0001
-0.0004
-0.0039
-0.0037
0.0001
    :
    :
E = 5000x1
0.0000
0.0000
0.0389
0.0002
0.0001
0.0489
0.0012
0.0090
0.0266
0.0001
    :
    :
theta = 401x1
    0
    0
    0
-0.0000
0.0000
0.0001
-0.0004
-0.0038
-0.0036
0.0000

```

```

      :
      :
E = 5000×1
0.0000
0.0000
0.0457
0.0002
0.0002
0.0568
0.0014
0.0111
0.0309
0.0001
      :
      :
Iteration      35 | Cost: 9.091228e-02
theta = 401×1
      0
      0
      0
-0.0000
0.0000
0.0001
-0.0004
-0.0042
-0.0040
0.0001
      :
      :
E = 5000×1
0.0000
0.0000
0.0365
0.0002
0.0001
0.0486
0.0013
0.0068
0.0287
0.0001
      :
      :
theta = 401×1
      0
      0
      0
-0.0000
0.0000
0.0001
-0.0004
-0.0040
-0.0038
0.0001
      :
      :
E = 5000×1
0.0000
0.0000
0.0410
0.0002
0.0001
0.0527
0.0014
0.0088

```

```

0.0298
0.0001
:
:
Iteration    36 | Cost: 9.075902e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0004
-0.0040
-0.0038
0.0001
:
:
E = 5000x1
0.0000
0.0000
0.0441
0.0002
0.0001
0.0577
0.0015
0.0091
0.0336
0.0001
:
:
Iteration    37 | Cost: 9.055123e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0004
-0.0041
-0.0039
0.0001
:
:
E = 5000x1
0.0000
0.0000
0.0417
0.0002
0.0001
0.0569
0.0015
0.0093
0.0327
0.0001
:
:
theta = 401x1
0
0
0
-0.0000
0.0000

```



```

0.0001
-0.0004
-0.0041
-0.0039
0.0001
:
:
E = 5000×1
0.0000
0.0000
0.0374
0.0002
0.0001
0.0553
0.0014
0.0096
0.0310
0.0001
:
:
Iteration    38 | Cost: 8.988150e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0004
-0.0042
-0.0040
0.0001
:
:
E = 5000×1
0.0000
0.0000
0.0469
0.0002
0.0002
0.0729
0.0020
0.0125
0.0431
0.0001
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0004
-0.0042
-0.0040
0.0001
:
:
E = 5000×1
0.0000
0.0000
0.0424

```

```

0.0002
0.0002
0.0645
0.0017
0.0111
0.0372
0.0001
:
:
Iteration    39 | Cost: 8.962484e-02
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0001
-0.0004
-0.0043
-0.0041
0.0001
:
:
E = 5000x1
0.0000
0.0000
0.0426
0.0002
0.0002
0.0728
0.0019
0.0140
0.0418
0.0001
:
:
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0001
-0.0004
-0.0043
-0.0040
0.0001
:
:
E = 5000x1
0.0000
0.0000
0.0425
0.0002
0.0002
0.0689
0.0018
0.0126
0.0396
0.0001
:
:
Iteration    40 | Cost: 8.948734e-02
theta = 401x1

```

```

0
0
0
-0.0000
0.0000
0.0001
-0.0004
-0.0043
-0.0040
0.0001
:
:
E = 5000×1
0.0000
0.0000
0.0376
0.0002
0.0002
0.0631
0.0016
0.0122
0.0352
0.0001
:
:
Iteration    41 | Cost: 8.933839e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0004
-0.0043
-0.0041
0.0001
:
:
E = 5000×1
0.0000
0.0000
0.0382
0.0002
0.0002
0.0577
0.0016
0.0104
0.0334
0.0001
:
:
Iteration    42 | Cost: 8.918665e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0004
-0.0044
-0.0041
0.0001

```

```

      :
      :
E = 5000×1
    0.0000
    0.0000
    0.0550
    0.0003
    0.0002
    0.0750
    0.0022
    0.0109
    0.0489
    0.0001
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
     0.0001
    -0.0004
    -0.0043
    -0.0041
     0.0001
      :
      :
E = 5000×1
    0.0000
    0.0000
    0.0401
    0.0002
    0.0002
    0.0598
    0.0016
    0.0104
    0.0351
    0.0001
      :
      :
Iteration    43 | Cost: 8.916816e-02
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
     0.0001
    -0.0004
    -0.0043
    -0.0041
     0.0001
      :
      :
E = 5000×1
    0.0000
    0.0000
    0.0403
    0.0002
    0.0002
    0.0602
    0.0017
    0.0104

```

```

0.0356
0.0001
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0004
-0.0044
-0.0041
0.0001
:
:
E = 5000x1
0.0000
0.0000
0.0408
0.0002
0.0002
0.0610
0.0017
0.0103
0.0366
0.0001
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0004
-0.0045
-0.0042
0.0001
:
:
E = 5000x1
0.0000
0.0000
0.0423
0.0002
0.0002
0.0636
0.0018
0.0100
0.0396
0.0001
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0003

```

```

-0.0048
-0.0044
0.0002
:
:
E = 5000×1
0.0000
0.0000
0.0471
0.0003
0.0002
0.0720
0.0021
0.0093
0.0504
0.0001
:
:
Iteration 44 | Cost: 8.864975e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0003
-0.0052
-0.0047
0.0002
:
:
E = 5000×1
0.0000
0.0000
0.0335
0.0002
0.0002
0.0538
0.0016
0.0072
0.0387
0.0001
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0003
-0.0049
-0.0045
0.0002
:
:
E = 5000×1
0.0000
0.0000
0.0422
0.0002
0.0002

```

```

0.0656
0.0019
0.0086
0.0463
0.0001
:
:
Iteration    45 | Cost: 8.849670e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0003
-0.0051
-0.0046
0.0002
:
:
E = 5000x1
0.0000
0.0000
0.0427
0.0002
0.0002
0.0641
0.0020
0.0084
0.0474
0.0001
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0003
-0.0054
-0.0049
0.0003
:
:
E = 5000x1
0.0000
0.0000
0.0437
0.0003
0.0002
0.0611
0.0021
0.0081
0.0496
0.0001
:
:
theta = 401x1
0
0
0

```

```

-0.0000
 0.0000
 0.0001
-0.0002
-0.0063
-0.0055
 0.0004
  :
  :
E = 5000×1
 0.0000
 0.0000
 0.0468
 0.0003
 0.0002
 0.0530
 0.0023
 0.0073
 0.0569
 0.0001
  :
  :
Iteration    46 | Cost: 8.709472e-02
theta = 401×1
      0
      0
      0
-0.0000
 0.0000
 0.0001
-0.0002
-0.0071
-0.0061
 0.0005
  :
  :
E = 5000×1
 0.0001
 0.0000
 0.1441
 0.0010
 0.0006
 0.1632
 0.0099
 0.0132
 0.2481
 0.0002
  :
  :
theta = 401×1
      0
      0
      0
-0.0000
 0.0000
 0.0001
-0.0002
-0.0064
-0.0056
 0.0004
  :
  :
E = 5000×1
 0.0001

```



```

0.0000
0.0526
0.0004
0.0002
0.0596
0.0027
0.0078
0.0668
0.0001
:
:
Iteration    47 | Cost: 8.698890e-02
theta = 401x1
    0
    0
    0
-0.0000
0.0000
0.0001
-0.0002
-0.0066
-0.0057
0.0005
:
:
E = 5000x1
0.0001
0.0000
0.0513
0.0004
0.0002
0.0623
0.0028
0.0079
0.0710
0.0001
:
:
theta = 401x1
    0
    0
    0
-0.0000
0.0000
0.0001
-0.0002
-0.0068
-0.0059
0.0005
:
:
E = 5000x1
0.0000
0.0000
0.0488
0.0003
0.0002
0.0679
0.0029
0.0082
0.0800
0.0001
:
:

```

Iteration 48 | Cost: 8.651845e-02

theta = 401x1

0
0
0

-0.0000
0.0000
0.0001
-0.0002
-0.0070
-0.0060
0.0005

⋮

E = 5000x1

0.0000
0.0000
0.0382
0.0003
0.0002
0.0595
0.0024
0.0076
0.0685
0.0001

⋮

Iteration 49 | Cost: 8.590833e-02

theta = 401x1

0
0
0

-0.0000
0.0000
0.0001
-0.0002
-0.0063
-0.0055
0.0004

⋮

E = 5000x1

0.0000
0.0000
0.0244
0.0002
0.0001
0.0213
0.0010
0.0042
0.0200
0.0000

⋮

theta = 401x1

0
0
0

-0.0000
0.0000
0.0001
-0.0002
-0.0070
-0.0060

```

0.0005
:
E = 5000×1
0.0000
0.0000
0.0366
0.0002
0.0002
0.0538
0.0022
0.0072
0.0608
0.0001
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0002
-0.0070
-0.0060
0.0005
:
E = 5000×1
0.0000
0.0000
0.0371
0.0002
0.0002
0.0557
0.0023
0.0073
0.0633
0.0001
:
Iteration    50 | Cost: 8.588063e-02
theta = 401×1
0
0
0
0
0
0
0
0
0
0
0
:
E = 5000×1
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000
0.5000

```

```

0.5000
0.5000
0.5000
:
:
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
0.0000
0.0000
-0.0000
-0.0000
-0.0000
-0.0000
:
:
E = 5000x1
0.1002
0.0838
0.0568
0.0590
0.0622
0.0798
0.0514
0.2332
0.0456
0.0783
:
:
Iteration      1 | Cost: 3.369306e-01
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
0.0000
0.0000
-0.0004
-0.0006
-0.0005
-0.0003
:
:
E = 5000x1
0.0012
0.0002
0.0011
0.0003
0.0059
0.0270
0.0026
0.0002
0.0077
0.0008
:
:
theta = 401x1
1.0e+00 *
    0
    0

```

```

0
-0.0000
0.0000
0.0000
-0.0001
-0.0002
-0.0002
-0.0001
:
:
E = 5000×1
0.0233
0.0110
0.0150
0.0098
0.0283
0.0556
0.0190
0.0240
0.0251
0.0173
:
:
Iteration      2 | Cost: 2.513191e-01
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0003
-0.0005
-0.0003
-0.0002
:
:
E = 5000×1
0.0004
0.0001
0.0001
0.0001
0.0002
0.0009
0.0001
0.0011
0.0001
0.0002
:
:
Iteration      3 | Cost: 2.358271e-01
theta = 401×1
0
0
0
-0.0000
0.0002
0.0005
-0.0187
-0.0246
-0.0119
-0.0074

```

```

      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
     0.0001
     0.0002
    -0.0095
    -0.0125
    -0.0061
    -0.0038
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
     0.0001
     0.0001
    -0.0049
    -0.0065
    -0.0032
    -0.0020
      :
      :
E = 5000×1
1.0e+00 *
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000
    0.0000

```

```

0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0008
-0.0011
-0.0006
-0.0004
:
:
E = 5000x1
1.0e+00 *
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
0.0000
:
:
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0005
-0.0006
-0.0004
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0001
0.0000
0.0000
0.0000
0.0001
0.0004
0.0000
0.0004
0.0000
0.0001
:
:
Iteration      4 | Cost: 2.352523e-01
theta = 401x1
1.0e+00 *

```

```

0
0
0
-0.0000
0.0000
0.0000
-0.0005
-0.0006
-0.0004
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0001
0.0000
0.0000
0.0000
0.0001
0.0004
0.0000
0.0004
0.0000
0.0001
:
:
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0005
-0.0006
-0.0004
-0.0002
:
:
E = 5000x1
1.0e+00 *
0.0002
0.0000
0.0000
0.0000
0.0001
0.0004
0.0000
0.0004
0.0001
0.0001
:
:
theta = 401x1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0005
-0.0006

```



```

-0.0004
-0.0002
:
E = 5000×1
1.0e+00 *
0.0002
0.0000
0.0000
0.0000
0.0001
0.0005
0.0001
0.0004
0.0001
0.0001
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0005
-0.0007
-0.0004
-0.0002
:
E = 5000×1
1.0e+00 *
0.0003
0.0001
0.0001
0.0000
0.0002
0.0009
0.0001
0.0005
0.0001
0.0001
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
0.0000
0.0000
-0.0005
-0.0007
-0.0004
-0.0002
:
E = 5000×1
0.0006
0.0001
0.0002

```

```

0.0001
0.0005
0.0021
0.0003
0.0006
0.0004
0.0003
:
:
Iteration      5 | Cost: 1.867055e-01
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0015
-0.0019
-0.0006
-0.0006
:
:
E = 5000x1
0.0046
0.0006
0.0025
0.0008
0.0018
0.0087
0.0070
0.0009
0.0026
0.0025
:
:
Iteration      6 | Cost: 1.526791e-01
theta = 401x1
      0
      0
      0
-0.0000
0.0000
0.0001
-0.0032
-0.0038
-0.0009
-0.0013
:
:
E = 5000x1
0.0008
0.0000
0.0002
0.0000
0.0000
0.0003
0.0010
0.0001
0.0000
0.0003
:
:
theta = 401x1

```

```

0
0
0
-0.0000
0.0000
0.0000
-0.0018
-0.0022
-0.0006
-0.0007
:
:
E = 5000×1
0.0036
0.0004
0.0017
0.0005
0.0010
0.0054
0.0053
0.0007
0.0014
0.0018
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0017
-0.0020
-0.0006
-0.0006
:
:
E = 5000×1
0.0040
0.0005
0.0020
0.0006
0.0013
0.0065
0.0059
0.0007
0.0018
0.0021
:
:
Iteration      7 | Cost: 1.488460e-01
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0017
-0.0020
-0.0006
-0.0007

```

```

      :
      :
E = 5000×1
    0.0031
    0.0004
    0.0015
    0.0005
    0.0012
    0.0059
    0.0045
    0.0007
    0.0015
    0.0016
      :
      :
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
     0.0000
    -0.0016
    -0.0019
    -0.0006
    -0.0007
      :
      :
E = 5000×1
    0.0020
    0.0002
    0.0008
    0.0003
    0.0009
    0.0049
    0.0027
    0.0005
    0.0011
    0.0010
      :
      :
Iteration      8 | Cost: 1.385401e-01
theta = 401×1
      0
      0
      0
    -0.0000
     0.0000
     0.0000
    -0.0015
    -0.0019
    -0.0006
    -0.0009
      :
      :
E = 5000×1
    0.0040
    0.0005
    0.0028
    0.0009
    0.0043
    0.0216
    0.0099
    0.0006

```

```

0.0063
0.0027
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0016
-0.0019
-0.0006
-0.0007
:
:
E = 5000x1
0.0022
0.0003
0.0010
0.0004
0.0012
0.0065
0.0034
0.0005
0.0016
0.0012
:
:
Iteration 9 | Cost: 1.363013e-01
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0016
-0.0020
-0.0007
-0.0009
:
:
E = 5000x1
0.0023
0.0003
0.0013
0.0004
0.0011
0.0061
0.0036
0.0004
0.0014
0.0013
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000

```

```

-0.0017
-0.0021
-0.0007
-0.0012
:
:
E = 5000×1
0.0025
0.0002
0.0018
0.0005
0.0008
0.0052
0.0038
0.0003
0.0012
0.0013
:
:
Iteration    10 | Cost: 1.276495e-01
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0019
-0.0022
-0.0008
-0.0017
:
:
E = 5000×1
0.0008
0.0001
0.0007
0.0002
0.0002
0.0015
0.0013
0.0001
0.0003
0.0005
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0000
-0.0018
-0.0021
-0.0008
-0.0013
:
:
E = 5000×1
0.0018
0.0002
0.0013
0.0004

```

```

0.0005
0.0035
0.0027
0.0002
0.0008
0.0010
:
:
Iteration    11 | Cost: 1.258539e-01
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0018
-0.0022
-0.0008
-0.0016
:
:
E = 5000x1
0.0014
0.0001
0.0013
0.0003
0.0004
0.0029
0.0026
0.0001
0.0007
0.0009
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0000
-0.0020
-0.0024
-0.0009
-0.0021
:
:
E = 5000x1
0.0010
0.0001
0.0013
0.0003
0.0002
0.0020
0.0025
0.0001
0.0005
0.0007
:
:
Iteration    12 | Cost: 1.193549e-01
theta = 401x1
0

```

```

0
0
-0.0000
0.0000
0.0000
-0.0021
-0.0024
-0.0010
-0.0024
:
:
E = 5000×1
0.0014
0.0001
0.0029
0.0006
0.0003
0.0032
0.0052
0.0001
0.0011
0.0012
:
:
Iteration    13 | Cost: 1.139919e-01
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0024
-0.0028
-0.0012
-0.0036
:
:
E = 5000×1
0.0009
0.0000
0.0049
0.0006
0.0001
0.0016
0.0050
0.0000
0.0006
0.0010
:
:
Iteration    14 | Cost: 1.070966e-01
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0025
-0.0029
-0.0013
-0.0042

```



```

      :
      :
E = 5000×1
    0.0003
    0.0000
    0.0019
    0.0002
    0.0000
    0.0005
    0.0015
    0.0000
    0.0001
    0.0004
      :
      :
theta = 401×1
        0
        0
        0
    -0.0000
    0.0000
    0.0001
    -0.0024
    -0.0028
    -0.0013
    -0.0039
      :
      :
E = 5000×1
    0.0005
    0.0000
    0.0029
    0.0003
    0.0000
    0.0008
    0.0024
    0.0000
    0.0003
    0.0006
      :
      :
Iteration    15 | Cost: 1.037065e-01
theta = 401×1
        0
        0
        0
    -0.0000
    0.0000
    0.0001
    -0.0028
    -0.0031
    -0.0015
    -0.0052
      :
      :
E = 5000×1
    0.0002
    0.0000
    0.0017
    0.0001
    0.0000
    0.0003
    0.0009
    0.0000

```

```

0.0001
0.0002
:
Iteration    16 | Cost: 9.936582e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0029
-0.0032
-0.0015
-0.0057
:
:
E = 5000x1
0.0004
0.0000
0.0051
0.0004
0.0000
0.0010
0.0034
0.0000
0.0005
0.0007
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0028
-0.0031
-0.0015
-0.0053
:
:
E = 5000x1
0.0002
0.0000
0.0020
0.0002
0.0000
0.0003
0.0011
0.0000
0.0001
0.0003
:
:
Iteration    17 | Cost: 9.883916e-02
theta = 401x1
0
0
0
-0.0000
0.0000

```

```

0.0001
-0.0028
-0.0031
-0.0015
-0.0054
:
:
E = 5000×1
0.0002
0.0000
0.0018
0.0001
0.0000
0.0003
0.0010
0.0000
0.0001
0.0003
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0029
-0.0031
-0.0015
-0.0056
:
:
E = 5000×1
0.0002
0.0000
0.0014
0.0001
0.0000
0.0003
0.0009
0.0000
0.0001
0.0002
:
:
Iteration    18 | Cost: 9.734415e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0030
-0.0032
-0.0014
-0.0059
:
:
E = 5000×1
1.0e+00 *
0.0001
0.0000

```

```

0.0006
0.0000
0.0000
0.0001
0.0003
0.0000
0.0000
0.0001
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0029
-0.0031
-0.0015
-0.0056
:
:
E = 5000x1
0.0001
0.0000
0.0012
0.0001
0.0000
0.0003
0.0007
0.0000
0.0001
0.0002
:
:
Iteration    19 | Cost: 9.705827e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0029
-0.0031
-0.0015
-0.0057
:
:
E = 5000x1
0.0002
0.0000
0.0012
0.0001
0.0000
0.0003
0.0007
0.0000
0.0001
0.0002
:
:
theta = 401x1

```

```

0
0
0
-0.0000
0.0000
0.0001
-0.0030
-0.0031
-0.0014
-0.0059
:
:
E = 5000×1
0.0002
0.0000
0.0014
0.0001
0.0000
0.0003
0.0008
0.0000
0.0001
0.0002
:
:
Iteration    20 | Cost: 9.578377e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0030
-0.0031
-0.0014
-0.0059
:
:
E = 5000×1
0.0004
0.0000
0.0036
0.0003
0.0000
0.0008
0.0024
0.0000
0.0004
0.0006
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0030
-0.0031
-0.0014
-0.0059

```

```

      :
      :
E = 5000×1
  0.0002
  0.0000
  0.0015
  0.0001
  0.0000
  0.0003
  0.0009
  0.0000
  0.0001
  0.0003
  :
  :
Iteration    21 | Cost: 9.569713e-02
theta = 401×1
      0
      0
      0
    -0.0000
    0.0000
    0.0001
    -0.0030
    -0.0031
    -0.0014
    -0.0059
      :
      :
E = 5000×1
  0.0002
  0.0000
  0.0015
  0.0001
  0.0000
  0.0003
  0.0009
  0.0000
  0.0001
  0.0003
  :
  :
theta = 401×1
      0
      0
      0
    -0.0000
    0.0000
    0.0001
    -0.0030
    -0.0031
    -0.0014
    -0.0060
      :
      :
E = 5000×1
  0.0002
  0.0000
  0.0015
  0.0001
  0.0000
  0.0003
  0.0009
  0.0000

```

```

0.0001
0.0003
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0031
-0.0031
-0.0014
-0.0061
:
:
E = 5000x1
0.0002
0.0000
0.0014
0.0001
0.0000
0.0004
0.0009
0.0000
0.0001
0.0003
:
:
Iteration    22 | Cost: 9.483495e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0031
-0.0031
-0.0014
-0.0064
:
:
E = 5000x1
0.0003
0.0000
0.0023
0.0002
0.0000
0.0006
0.0017
0.0000
0.0003
0.0006
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001

```

```

-0.0031
-0.0031
-0.0014
-0.0063
:
:
E = 5000×1
0.0003
0.0000
0.0018
0.0002
0.0000
0.0005
0.0013
0.0000
0.0002
0.0004
:
:
Iteration    23 | Cost: 9.439928e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0032
-0.0031
-0.0014
-0.0066
:
:
E = 5000×1
0.0003
0.0000
0.0020
0.0002
0.0000
0.0005
0.0015
0.0000
0.0003
0.0005
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0033
-0.0031
-0.0013
-0.0070
:
:
E = 5000×1
0.0005
0.0000
0.0025
0.0002

```



```

0.0000
0.0007
0.0019
0.0000
0.0004
0.0008
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0035
-0.0031
-0.0012
-0.0079
:
:
E = 5000x1
0.0010
0.0001
0.0037
0.0004
0.0001
0.0010
0.0030
0.0000
0.0008
0.0018
:
:
Iteration    24 | Cost: 9.143805e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0037
-0.0031
-0.0012
-0.0086
:
:
E = 5000x1
0.0007
0.0001
0.0015
0.0002
0.0000
0.0004
0.0011
0.0000
0.0003
0.0011
:
:
theta = 401x1
0
0

```

```

      0
    -0.0000
      0.0000
      0.0001
    -0.0036
    -0.0031
    -0.0012
    -0.0081
      :
      :
E = 5000×1
      0.0009
      0.0001
      0.0031
      0.0003
      0.0000
      0.0009
      0.0024
      0.0000
      0.0006
      0.0016
      :
      :
Iteration    25 | Cost: 9.082974e-02
theta = 401×1
      0
      0
      0
    -0.0000
      0.0000
      0.0001
    -0.0036
    -0.0031
    -0.0012
    -0.0083
      :
      :
E = 5000×1
      0.0010
      0.0001
      0.0033
      0.0004
      0.0000
      0.0008
      0.0024
      0.0000
      0.0006
      0.0017
      :
      :
Iteration    26 | Cost: 8.992841e-02
theta = 401×1
      0
      0
      0
    -0.0000
      0.0000
      0.0001
    -0.0036
    -0.0032
    -0.0012
    -0.0082
      :
      :

```

```

E = 5000×1
    0.0012
    0.0001
    0.0044
    0.0005
    0.0001
    0.0011
    0.0031
    0.0000
    0.0008
    0.0019
    ⋮
theta = 401×1
    0
    0
    0
   -0.0000
    0.0000
    0.0001
   -0.0036
   -0.0031
   -0.0012
   -0.0083
    ⋮
E = 5000×1
    0.0011
    0.0001
    0.0034
    0.0004
    0.0000
    0.0009
    0.0025
    0.0000
    0.0006
    0.0017
    ⋮
Iteration    27 | Cost: 8.982376e-02
theta = 401×1
    0
    0
    0
   -0.0000
    0.0000
    0.0001
   -0.0036
   -0.0031
   -0.0012
   -0.0083
    ⋮
E = 5000×1
    0.0010
    0.0001
    0.0032
    0.0003
    0.0000
    0.0008
    0.0023
    0.0000
    0.0006
    0.0016

```

```

      :
      :
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0001
     -0.0036
     -0.0032
     -0.0012
     -0.0083
      :
      :
E = 5000x1
      0.0009
      0.0001
      0.0027
      0.0003
      0.0000
      0.0007
      0.0019
      0.0000
      0.0005
      0.0013
      :
      :
Iteration    28 | Cost: 8.939125e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0001
     -0.0036
     -0.0032
     -0.0012
     -0.0083
      :
      :
E = 5000x1
      0.0009
      0.0001
      0.0028
      0.0003
      0.0000
      0.0007
      0.0018
      0.0000
      0.0004
      0.0013
      :
      :
Iteration    29 | Cost: 8.917813e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0001
     -0.0036

```

```

-0.0032
-0.0012
-0.0086
:
:
E = 5000×1
0.0006
0.0000
0.0018
0.0002
0.0000
0.0004
0.0010
0.0000
0.0002
0.0006
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0036
-0.0032
-0.0012
-0.0084
:
:
E = 5000×1
0.0008
0.0001
0.0026
0.0003
0.0000
0.0007
0.0017
0.0000
0.0004
0.0012
:
:
Iteration 30 | Cost: 8.913997e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0036
-0.0032
-0.0012
-0.0084
:
:
E = 5000×1
0.0008
0.0001
0.0025
0.0003
0.0000

```

```

0.0006
0.0016
0.0000
0.0004
0.0011
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0036
-0.0032
-0.0012
-0.0084
:
:
E = 5000x1
0.0008
0.0001
0.0024
0.0003
0.0000
0.0006
0.0016
0.0000
0.0004
0.0011
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0001
-0.0036
-0.0032
-0.0012
-0.0084
:
:
E = 5000x1
0.0007
0.0000
0.0020
0.0002
0.0000
0.0005
0.0013
0.0000
0.0003
0.0009
:
:
Iteration 31 | Cost: 8.878267e-02
theta = 401x1
0
0
0

```

```

-0.0000
 0.0000
 0.0001
-0.0037
-0.0032
-0.0012
-0.0086
  ⋮
  ⋮
E = 5000×1
 0.0007
 0.0000
 0.0019
 0.0002
 0.0000
 0.0005
 0.0013
 0.0000
 0.0003
 0.0009
  ⋮
  ⋮
Iteration    32 | Cost: 8.832440e-02
theta = 401×1
 0
 0
 0
-0.0000
 0.0000
 0.0001
-0.0037
-0.0032
-0.0012
-0.0088
  ⋮
  ⋮
E = 5000×1
 0.0009
 0.0001
 0.0027
 0.0003
 0.0000
 0.0006
 0.0017
 0.0000
 0.0004
 0.0012
  ⋮
  ⋮
theta = 401×1
 0
 0
 0
-0.0000
 0.0000
 0.0001
-0.0037
-0.0032
-0.0012
-0.0087
  ⋮
  ⋮
E = 5000×1
 0.0007

```

```

0.0000
0.0022
0.0003
0.0000
0.0006
0.0014
0.0000
0.0003
0.0010
:
:
Iteration    33 | Cost: 8.816147e-02
theta = 401x1
    0
    0
    0
-0.0000
0.0000
0.0001
-0.0037
-0.0032
-0.0012
-0.0088
:
:
E = 5000x1
0.0008
0.0000
0.0024
0.0003
0.0000
0.0005
0.0015
0.0000
0.0003
0.0010
:
:
theta = 401x1
    0
    0
    0
-0.0000
0.0000
0.0001
-0.0037
-0.0032
-0.0012
-0.0091
:
:
E = 5000x1
0.0009
0.0001
0.0027
0.0003
0.0000
0.0005
0.0015
0.0000
0.0003
0.0011
:
:

```


Iteration 34 | Cost: 8.757932e-02

theta = 401x1

0
0
0
-0.0000
0.0000
0.0001
-0.0038
-0.0032
-0.0012
-0.0092
:
:

E = 5000x1

0.0007
0.0000
0.0019
0.0002
0.0000
0.0004
0.0010
0.0000
0.0002
0.0008
:
:

theta = 401x1

0
0
0
-0.0000
0.0000
0.0001
-0.0038
-0.0032
-0.0012
-0.0091
:
:

E = 5000x1

0.0008
0.0000
0.0024
0.0003
0.0000
0.0004
0.0013
0.0000
0.0003
0.0010
:
:

Iteration 35 | Cost: 8.739009e-02

theta = 401x1

0
0
0
-0.0000
0.0000
0.0001
-0.0038
-0.0032
-0.0012

```

-0.0092
:
E = 5000×1
0.0008
0.0000
0.0022
0.0002
0.0000
0.0004
0.0013
0.0000
0.0003
0.0010
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0001
-0.0038
-0.0032
-0.0012
-0.0093
:
:
E = 5000×1
0.0007
0.0000
0.0020
0.0002
0.0000
0.0004
0.0012
0.0000
0.0003
0.0009
:
:
Iteration    36 | Cost: 8.699281e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0002
-0.0038
-0.0032
-0.0011
-0.0095
:
:
E = 5000×1
0.0010
0.0001
0.0032
0.0003
0.0000
0.0007
0.0019

```

```

0.0000
0.0005
0.0014
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0038
-0.0032
-0.0012
-0.0093
:
:
E = 5000x1
0.0008
0.0000
0.0022
0.0002
0.0000
0.0005
0.0013
0.0000
0.0003
0.0010
:
:
Iteration 37 | Cost: 8.693567e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0038
-0.0032
-0.0012
-0.0093
:
:
E = 5000x1
0.0008
0.0000
0.0021
0.0002
0.0000
0.0005
0.0012
0.0000
0.0003
0.0010
:
:
theta = 401x1
0
0
0
-0.0000
0.0000

```

```

    0.0002
   -0.0038
   -0.0032
   -0.0012
   -0.0094
    :
    :
E = 5000×1
    0.0008
    0.0000
    0.0021
    0.0002
    0.0000
    0.0004
    0.0012
    0.0000
    0.0003
    0.0010
    :
    :
theta = 401×1
    0
    0
    0
   -0.0000
    0.0000
    0.0002
   -0.0039
   -0.0032
   -0.0011
   -0.0097
    :
    :
E = 5000×1
    0.0007
    0.0000
    0.0019
    0.0002
    0.0000
    0.0004
    0.0010
    0.0000
    0.0003
    0.0009
    :
    :
Iteration    38 | Cost: 8.623918e-02
theta = 401×1
    0
    0
    0
   -0.0000
    0.0000
    0.0002
   -0.0040
   -0.0033
   -0.0011
   -0.0099
    :
    :
E = 5000×1
1.0e+00 *
    0.0004
    0.0000

```

```

0.0010
0.0001
0.0000
0.0002
0.0005
0.0000
0.0001
0.0005
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0039
-0.0032
-0.0011
-0.0097
:
:
E = 5000x1
0.0007
0.0000
0.0017
0.0002
0.0000
0.0003
0.0009
0.0000
0.0002
0.0008
:
:
Iteration    39 | Cost: 8.616863e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0039
-0.0032
-0.0011
-0.0098
:
:
E = 5000x1
0.0007
0.0000
0.0017
0.0002
0.0000
0.0003
0.0009
0.0000
0.0002
0.0008
:
:
theta = 401x1

```

```

0
0
0
-0.0000
0.0000
0.0002
-0.0039
-0.0033
-0.0011
-0.0099
:
:
E = 5000×1
0.0006
0.0000
0.0016
0.0002
0.0000
0.0003
0.0008
0.0000
0.0002
0.0008
:
:
Iteration    40 | Cost: 8.587680e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0002
-0.0040
-0.0033
-0.0011
-0.0100
:
:
E = 5000×1
0.0007
0.0000
0.0019
0.0002
0.0000
0.0004
0.0010
0.0000
0.0003
0.0010
:
:
Iteration    41 | Cost: 8.572494e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0002
-0.0041
-0.0033
-0.0011
-0.0106

```

```

      :
      :
E = 5000×1
    0.0011
    0.0001
    0.0033
    0.0003
    0.0000
    0.0005
    0.0017
    0.0000
    0.0006
    0.0018
      :
      :
theta = 401×1
        0
        0
        0
    -0.0000
     0.0000
     0.0002
    -0.0040
    -0.0033
    -0.0011
    -0.0100
      :
      :
E = 5000×1
    0.0008
    0.0000
    0.0021
    0.0002
    0.0000
    0.0004
    0.0011
    0.0000
    0.0003
    0.0011
      :
      :
Iteration    42 | Cost: 8.569798e-02
theta = 401×1
        0
        0
        0
    -0.0000
     0.0000
     0.0002
    -0.0040
    -0.0033
    -0.0011
    -0.0101
      :
      :
E = 5000×1
    0.0008
    0.0000
    0.0020
    0.0002
    0.0000
    0.0004
    0.0011
    0.0000

```

```

0.0003
0.0010
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0040
-0.0033
-0.0011
-0.0101
:
:
E = 5000x1
0.0008
0.0000
0.0020
0.0002
0.0000
0.0004
0.0010
0.0000
0.0003
0.0010
:
:
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0040
-0.0033
-0.0011
-0.0101
:
:
E = 5000x1
0.0007
0.0000
0.0018
0.0002
0.0000
0.0003
0.0009
0.0000
0.0003
0.0010
:
:
Iteration    43 | Cost: 8.540576e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002

```



```

-0.0040
-0.0033
-0.0011
-0.0103
:
:
E = 5000×1
0.0008
0.0000
0.0021
0.0002
0.0000
0.0003
0.0010
0.0000
0.0003
0.0011
:
:
Iteration    44 | Cost: 8.508283e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0002
-0.0041
-0.0033
-0.0011
-0.0105
:
:
E = 5000×1
0.0007
0.0000
0.0016
0.0002
0.0000
0.0002
0.0007
0.0000
0.0002
0.0009
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0002
-0.0041
-0.0033
-0.0011
-0.0104
:
:
E = 5000×1
0.0008
0.0000
0.0019
0.0002

```

```

0.0000
0.0003
0.0009
0.0000
0.0003
0.0010
:
:
Iteration    45 | Cost: 8.501162e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0041
-0.0033
-0.0011
-0.0105
:
:
E = 5000x1
0.0008
0.0000
0.0019
0.0002
0.0000
0.0003
0.0008
0.0000
0.0002
0.0010
:
:
Iteration    46 | Cost: 8.492190e-02
theta = 401x1
0
0
0
-0.0000
0.0000
0.0002
-0.0041
-0.0033
-0.0011
-0.0106
:
:
E = 5000x1
0.0008
0.0000
0.0019
0.0002
0.0000
0.0003
0.0009
0.0000
0.0002
0.0010
:
:
theta = 401x1
0

```

```

0
0
-0.0000
0.0000
0.0002
-0.0041
-0.0033
-0.0010
-0.0107
:
:
E = 5000×1
0.0009
0.0000
0.0021
0.0002
0.0000
0.0003
0.0009
0.0000
0.0003
0.0011
:
:
theta = 401×1
0
0
0
-0.0000
0.0000
0.0002
-0.0042
-0.0033
-0.0010
-0.0110
:
:
E = 5000×1
0.0010
0.0001
0.0024
0.0002
0.0000
0.0003
0.0010
0.0000
0.0003
0.0013
:
:
Iteration 47 | Cost: 8.443018e-02
theta = 401×1
0
0
0
-0.0000
0.0000
0.0002
-0.0044
-0.0034
-0.0010
-0.0118
:
:

```

```

E = 5000×1
  0.0011
  0.0001
  0.0025
  0.0002
  0.0000
  0.0002
  0.0009
  0.0000
  0.0003
  0.0015
  ⋮
theta = 401×1
    0
    0
    0
 -0.0000
  0.0000
  0.0003
 -0.0047
 -0.0035
 -0.0008
 -0.0134
  ⋮
  ⋮
E = 5000×1
  0.0015
  0.0001
  0.0026
  0.0003
  0.0000
  0.0002
  0.0008
  0.0000
  0.0003
  0.0020
  ⋮
  ⋮
Iteration    48 | Cost: 8.279043e-02
theta = 401×1
    0
    0
    0
 -0.0000
  0.0000
  0.0003
 -0.0050
 -0.0036
 -0.0007
 -0.0143
  ⋮
  ⋮
E = 5000×1
  0.0012
  0.0001
  0.0015
  0.0002
  0.0000
  0.0001
  0.0004
  0.0000
  0.0002
  0.0015

```

```

      :
      :
Iteration    49 | Cost: 8.175776e-02
theta = 401x1
      0
      0
      0
     -0.0000
      0.0000
      0.0004
     -0.0053
     -0.0037
     -0.0006
     -0.0157
      :
      :
E = 5000x1
      0.0013
      0.0001
      0.0011
      0.0001
      0.0000
      0.0001
      0.0003
      0.0000
      0.0002
      0.0017
      :
      :
Iteration    50 | Cost: 8.034931e-02
theta = 401x1
      0
      0
      0
      0
      0
      0
      0
      0
      0
      0
      :
      :
E = 5000x1
     -0.5000
     -0.5000
     -0.5000
     -0.5000
     -0.5000
     -0.5000
     -0.5000
     -0.5000
     -0.5000
     -0.5000
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
      0.0000

```

```

-0.0000
-0.0000
-0.0000
-0.0000
:
E = 5000×1
-0.8573
-0.8780
-0.9363
-0.9237
-0.9048
-0.8865
-0.9299
-0.7184
-0.9437
-0.8984
:
Iteration      1 | Cost: 3.478011e-01
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0001
-0.0002
-0.0002
-0.0001
:
:
E = 5000×1
-0.0014
-0.0017
-0.6377
-0.0562
-0.0003
-0.0010
-0.0101
-0.0424
-0.1056
-0.0281
:
:
Iteration      2 | Cost: 2.074559e-01
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0002
-0.0004
-0.0004
-0.0002
:
:
E = 5000×1
-0.0004

```

```

-0.0012
-0.9999
-0.8594
-0.0001
-0.0005
-0.2049
-0.0374
-0.9890
-0.3879
:
Iteration      3 | Cost: 1.108108e-01
theta = 401x1
      0
      0
      0
-0.0000
 0.0000
 0.0001
-0.0012
-0.0024
-0.0033
-0.0017
:
:
E = 5000x1
1.0e+00 *
      0
      0
-0.0000
      0
      0
      0
      0
      0
      0
      0
      0
      0
:
:
theta = 401x1
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0007
-0.0014
-0.0019
-0.0009
:
:
E = 5000x1
1.0e+00 *
      0
      0
-0.0000
      0
      0
      0
      0
      0
-0.0000
-0.0000
      0

```

```

      :
      :
theta = 401×1
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0005
     -0.0009
     -0.0011
     -0.0006
      :
      :
E = 5000×1
     -0.0000
     -0.0000
     -0.1483
     -0.0000
     -0.0000
     -0.0000
     -0.0000
     -0.0000
     -0.0000
     -0.0000
     -0.0000
      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0003
     -0.0006
     -0.0008
     -0.0004
      :
      :
E = 5000×1
     -0.0000
     -0.0000
     -0.9760
     -0.0001
     -0.0000
     -0.0000
     -0.0000
     -0.0000
     -0.0004
     -0.0132
     -0.0000
      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0003

```



```

-0.0005
-0.0006
-0.0003
:
:
E = 5000×1
-0.0000
-0.0000
-0.9991
-0.0708
-0.0000
-0.0000
-0.0035
-0.0059
-0.7241
-0.0091
:
:
Iteration      4 | Cost: 9.723535e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0002
-0.0005
-0.0006
-0.0003
:
:
E = 5000×1
-0.0000
-0.0000
-0.9832
-0.0082
-0.0000
-0.0000
-0.0068
-0.0239
-0.3970
-0.0031
:
:
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0002
-0.0005
-0.0006
-0.0003
:
:
E = 5000×1
-0.0000
-0.0003
-0.4164

```

```

-0.0003
-0.0006
-0.0003
-0.0180
-0.1730
-0.0744
-0.0006
:
:
Iteration      5 | Cost: 4.845901e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
 0.0000
-0.0004
-0.0007
-0.0004
:
:
E = 5000x1
1.0e+00 *
-0.0000
-0.0000
-0.0000
-0.0000
-0.0000
-0.0000
-0.0000
-0.0000
-0.0000
-0.0000
:
:
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0002
-0.0005
-0.0006
-0.0003
:
:
E = 5000x1
-0.0000
-0.0001
-0.0446
-0.0000
-0.0001
-0.0000
-0.0022
-0.0785
-0.0041
-0.0001

```

```

      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0002
     -0.0005
     -0.0006
     -0.0003
      :
      :
E = 5000×1
     -0.0000
     -0.0001
     -0.1305
     -0.0001
     -0.0002
     -0.0001
     -0.0054
     -0.1112
     -0.0144
     -0.0002
      :
      :
Iteration      6 | Cost: 4.571820e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
      0.0000
     -0.0002
     -0.0004
     -0.0006
     -0.0003
      :
      :
E = 5000×1
     -0.0000
     -0.0003
     -0.0872
     -0.0001
     -0.0003
     -0.0001
     -0.0054
     -0.0928
     -0.0076
     -0.0002
      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000

```

```

0.0000
-0.0001
-0.0004
-0.0007
-0.0003
:
:
E = 5000×1
-0.0001
-0.0011
-0.0373
-0.0001
-0.0007
-0.0000
-0.0055
-0.0641
-0.0021
-0.0002
:
:
Iteration      7 | Cost: 3.405605e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
0.0000
0.0001
0.0001
-0.0004
-0.0006
-0.0004
:
:
E = 5000×1
-0.0583
-0.4111
-0.9923
-0.3070
-0.4279
-0.0267
-0.9325
-0.4855
-0.9562
-0.2752
:
:
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
0.0000
0.0000
-0.0001
-0.0004
-0.0007
-0.0004
:
:
E = 5000×1
-0.0002

```

```

-0.0021
-0.0802
-0.0002
-0.0014
-0.0001
-0.0119
-0.0817
-0.0053
-0.0004
:
Iteration      8 | Cost: 3.350113e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
-0.0000
-0.0004
-0.0007
-0.0004
:
:
E = 5000x1
-0.0002
-0.0024
-0.0991
-0.0003
-0.0014
-0.0001
-0.0128
-0.0720
-0.0070
-0.0005
:
:
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
 0.0000
 0.0000
 0.0001
-0.0004
-0.0007
-0.0004
:
:
E = 5000x1
-0.0004
-0.0029
-0.1489
-0.0006
-0.0013
-0.0001
-0.0148
-0.0557
-0.0121
-0.0010

```

```

      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
    -0.0000
      0.0000
      0.0001
      0.0003
    -0.0003
    -0.0006
    -0.0004
      :
      :
E = 5000×1
    -0.0014
    -0.0044
    -0.3104
    -0.0029
    -0.0011
    -0.0001
    -0.0198
    -0.0326
    -0.0369
    -0.0039
      :
      :
Iteration      9 | Cost: 2.829574e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
    -0.0000
      0.0000
      0.0001
      0.0004
    -0.0003
    -0.0006
    -0.0004
      :
      :
E = 5000×1
    -0.0003
    -0.0004
    -0.0143
    -0.0002
    -0.0001
    -0.0000
    -0.0007
    -0.0084
    -0.0012
    -0.0004
      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
    -0.0000
      0.0000

```

```

0.0001
0.0003
-0.0003
-0.0006
-0.0004
:
:
E = 5000×1
-0.0009
-0.0024
-0.1621
-0.0014
-0.0005
-0.0000
-0.0088
-0.0234
-0.0162
-0.0022
:
:
Iteration    10 | Cost: 2.671193e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
0.0000
0.0001
0.0003
-0.0003
-0.0006
-0.0004
:
:
E = 5000×1
-0.0015
-0.0038
-0.0964
-0.0011
-0.0012
-0.0001
-0.0110
-0.0392
-0.0123
-0.0021
:
:
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
0.0000
0.0001
0.0004
-0.0003
-0.0007
-0.0004
:
:
E = 5000×1
-0.0031

```

```

-0.0085
-0.0377
-0.0007
-0.0051
-0.0002
-0.0160
-0.0906
-0.0077
-0.0019
:
Iteration    11 | Cost: 2.288809e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
    -0.0000
     0.0001
     0.0006
    -0.0002
    -0.0007
    -0.0006
      :
      :
E = 5000x1
    -0.0001
    -0.0002
    -0.0000
    -0.0000
    -0.0001
    -0.0000
    -0.0001
    -0.0000
    -0.0322
    -0.0000
    -0.0000
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
     0.0000
     0.0001
     0.0004
    -0.0003
    -0.0007
    -0.0004
      :
      :
E = 5000x1
    -0.0023
    -0.0058
    -0.0192
    -0.0004
    -0.0034
    -0.0001
    -0.0092
    -0.0819
    -0.0036
    -0.0011

```



```

      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
      0.0001
      0.0004
     -0.0003
     -0.0007
     -0.0004
      :
      :
E = 5000×1
     -0.0026
     -0.0068
     -0.0257
     -0.0005
     -0.0040
     -0.0001
     -0.0117
     -0.0856
     -0.0050
     -0.0014
      :
      :
Iteration    12 | Cost: 2.267282e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
      0.0000
      0.0001
      0.0004
     -0.0003
     -0.0007
     -0.0004
      :
      :
E = 5000×1
     -0.0028
     -0.0072
     -0.0269
     -0.0006
     -0.0041
     -0.0001
     -0.0121
     -0.0872
     -0.0048
     -0.0015
      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000

```

```

0.0001
0.0004
-0.0002
-0.0007
-0.0005
:
:
E = 5000×1
-0.0033
-0.0079
-0.0293
-0.0007
-0.0043
-0.0001
-0.0129
-0.0904
-0.0045
-0.0018
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0005
-0.0002
-0.0007
-0.0005
:
:
E = 5000×1
-0.0054
-0.0107
-0.0381
-0.0012
-0.0048
-0.0001
-0.0158
-0.1009
-0.0037
-0.0029
:
:
Iteration    13 | Cost: 2.048262e-02
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0007
-0.0001
-0.0007
-0.0007
:
:
E = 5000×1
-0.0011

```

```

-0.0013
-0.0080
-0.0003
-0.0005
-0.0000
-0.0022
-0.0603
-0.0006
-0.0011
  ⋮
theta = 401×1
1.0e+00 *
      0
      0
      0
    -0.0000
    -0.0000
     0.0001
     0.0006
    -0.0002
    -0.0007
    -0.0006
      ⋮
      ⋮
E = 5000×1
    -0.0038
    -0.0066
    -0.0268
    -0.0009
    -0.0029
    -0.0001
    -0.0101
    -0.0899
    -0.0024
    -0.0023
      ⋮
      ⋮
Iteration    14 | Cost: 2.001572e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
    -0.0000
    -0.0000
     0.0001
     0.0006
    -0.0002
    -0.0007
    -0.0006
      ⋮
      ⋮
E = 5000×1
    -0.0036
    -0.0056
    -0.0283
    -0.0009
    -0.0027
    -0.0000
    -0.0101
    -0.0974
    -0.0028
    -0.0029

```

```

      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000
      0.0001
      0.0007
     -0.0001
     -0.0007
     -0.0007
      :
      :
E = 5000×1
     -0.0032
     -0.0040
     -0.0315
     -0.0011
     -0.0023
     -0.0000
     -0.0102
     -0.1140
     -0.0039
     -0.0045
      :
      :
Iteration    15 | Cost: 1.815609e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000
      0.0001
      0.0007
     -0.0001
     -0.0007
     -0.0007
      :
      :
E = 5000×1
     -0.0127
     -0.0183
     -0.1391
     -0.0057
     -0.0158
     -0.0002
     -0.0655
     -0.2307
     -0.0298
     -0.0199
      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000

```

```

0.0001
0.0007
-0.0001
-0.0007
-0.0007
:
:
E = 5000×1
-0.0042
-0.0054
-0.0424
-0.0015
-0.0033
-0.0001
-0.0146
-0.1315
-0.0057
-0.0060
:
:
Iteration    16 | Cost: 1.791330e-02
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0007
-0.0001
-0.0007
-0.0007
:
:
E = 5000×1
-0.0033
-0.0042
-0.0331
-0.0011
-0.0031
-0.0001
-0.0130
-0.1366
-0.0057
-0.0047
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0007
-0.0001
-0.0007
-0.0007
:
:
E = 5000×1
-0.0021

```

```

-0.0027
-0.0210
-0.0006
-0.0028
-0.0001
-0.0104
-0.1462
-0.0056
-0.0031
:
Iteration    17 | Cost: 1.723808e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
    -0.0000
     0.0001
     0.0007
    -0.0001
    -0.0007
    -0.0007
      :
      :
E = 5000x1
    -0.0005
    -0.0005
    -0.0081
    -0.0002
    -0.0004
    -0.0000
    -0.0023
    -0.0597
    -0.0015
    -0.0008
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
    -0.0000
     0.0001
     0.0007
    -0.0001
    -0.0007
    -0.0007
      :
      :
E = 5000x1
    -0.0013
    -0.0016
    -0.0155
    -0.0004
    -0.0015
    -0.0000
    -0.0064
    -0.1109
    -0.0036
    -0.0020

```

```

      :
      :
Iteration    18 | Cost: 1.702208e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000
      0.0001
      0.0007
     -0.0001
     -0.0007
     -0.0007
      :
      :
E = 5000x1
     -0.0011
     -0.0014
     -0.0172
     -0.0004
     -0.0012
     -0.0000
     -0.0061
     -0.0954
     -0.0036
     -0.0019
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000
      0.0001
      0.0007
     -0.0001
     -0.0007
     -0.0008
      :
      :
E = 5000x1
     -0.0008
     -0.0010
     -0.0212
     -0.0005
     -0.0008
     -0.0000
     -0.0055
     -0.0702
     -0.0037
     -0.0018
      :
      :
Iteration    19 | Cost: 1.633115e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000

```

```

-0.0000
 0.0001
 0.0007
-0.0001
-0.0007
-0.0008
  ⋮
E = 5000×1
-0.0014
-0.0015
-0.0147
-0.0004
-0.0024
-0.0000
-0.0094
-0.1344
-0.0044
-0.0022
  ⋮
Iteration      20 | Cost: 1.586407e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0008
-0.0001
-0.0006
-0.0008
  ⋮
E = 5000×1
-0.0011
-0.0010
-0.0024
-0.0001
-0.0038
-0.0000
-0.0056
-0.2171
-0.0015
-0.0010
  ⋮
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0007
-0.0001
-0.0007
-0.0008
  ⋮
E = 5000×1

```



```

-0.0013
-0.0013
-0.0070
-0.0002
-0.0029
-0.0000
-0.0076
-0.1644
-0.0028
-0.0016
:
Iteration    21 | Cost: 1.557474e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
    -0.0000
     0.0001
     0.0007
    -0.0001
    -0.0007
    -0.0008
      :
      :
E = 5000x1
    -0.0009
    -0.0009
    -0.0058
    -0.0002
    -0.0017
    -0.0000
    -0.0051
    -0.1275
    -0.0020
    -0.0012
      :
      :
Iteration    22 | Cost: 1.528102e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
    -0.0000
    -0.0000
     0.0001
     0.0007
    -0.0001
    -0.0007
    -0.0008
      :
      :
E = 5000x1
    -0.0010
    -0.0009
    -0.0102
    -0.0003
    -0.0013
    -0.0000
    -0.0058
    -0.0978

```

```

-0.0026
-0.0016
:
Iteration    23 | Cost: 1.500042e-02
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
-0.0000
 0.0001
 0.0007
-0.0001
-0.0006
-0.0008
  :
  :
E = 5000x1
-0.0004
-0.0003
-0.0063
-0.0002
-0.0003
-0.0000
-0.0020
-0.0443
-0.0010
-0.0008
  :
  :
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
-0.0000
 0.0001
 0.0007
-0.0001
-0.0006
-0.0008
  :
  :
E = 5000x1
-0.0009
-0.0008
-0.0095
-0.0003
-0.0010
-0.0000
-0.0049
-0.0864
-0.0022
-0.0014
  :
  :
Iteration    24 | Cost: 1.495532e-02
theta = 401x1
1.0e+00 *
    0
    0

```

```

0
-0.0000
-0.0000
0.0001
0.0007
-0.0001
-0.0006
-0.0008
:
:
E = 5000×1
-0.0009
-0.0007
-0.0101
-0.0003
-0.0010
-0.0000
-0.0050
-0.0835
-0.0024
-0.0015
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0007
-0.0001
-0.0006
-0.0008
:
:
E = 5000×1
-0.0009
-0.0007
-0.0114
-0.0003
-0.0010
-0.0000
-0.0052
-0.0779
-0.0026
-0.0017
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0008
-0.0001
-0.0006
-0.0008
:
:

```

```

E = 5000×1
-0.0010
-0.0007
-0.0148
-0.0005
-0.0009
-0.0000
-0.0058
-0.0674
-0.0032
-0.0022
:
Iteration 25 | Cost: 1.464703e-02
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0008
-0.0001
-0.0006
-0.0008
:
E = 5000×1
-0.0007
-0.0004
-0.0079
-0.0003
-0.0006
-0.0000
-0.0032
-0.0514
-0.0019
-0.0016
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0008
-0.0001
-0.0006
-0.0008
:
E = 5000×1
-0.0009
-0.0005
-0.0112
-0.0004
-0.0007
-0.0000
-0.0044
-0.0599

```

```

-0.0026
-0.0019
:
Iteration    26 | Cost: 1.450265e-02
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
-0.0000
 0.0001
 0.0008
-0.0001
-0.0006
-0.0008
  :
  :
E = 5000x1
-0.0010
-0.0005
-0.0109
-0.0005
-0.0009
-0.0000
-0.0049
-0.0646
-0.0029
-0.0023
  :
  :
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
-0.0000
 0.0001
 0.0008
-0.0001
-0.0006
-0.0009
  :
  :
E = 5000x1
-0.0014
-0.0006
-0.0102
-0.0006
-0.0014
-0.0000
-0.0060
-0.0753
-0.0037
-0.0031
  :
  :
Iteration    27 | Cost: 1.399742e-02
theta = 401x1
1.0e+00 *
    0
    0

```

```

0
-0.0000
-0.0000
0.0001
0.0008
-0.0001
-0.0006
-0.0009
:
:
E = 5000×1
-0.0013
-0.0005
-0.0052
-0.0003
-0.0015
-0.0000
-0.0043
-0.0878
-0.0020
-0.0025
:
:
Iteration    28 | Cost: 1.345918e-02
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0008
-0.0001
-0.0006
-0.0009
:
:
E = 5000×1
-0.0022
-0.0010
-0.0063
-0.0004
-0.0034
-0.0000
-0.0070
-0.1289
-0.0026
-0.0040
:
:
Iteration    29 | Cost: 1.321219e-02
theta = 401×1
0
0
0
-0.0000
-0.0000
0.0001
0.0009
0.0000
-0.0006
-0.0010

```

```

      :
      :
E = 5000×1
-0.0152
-0.0083
-0.0012
-0.0001
-0.1036
-0.0000
-0.0131
-0.6079
-0.0005
-0.0120
      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
0.0001
0.0008
-0.0000
-0.0006
-0.0009
      :
      :
E = 5000×1
-0.0026
-0.0012
-0.0054
-0.0004
-0.0049
-0.0000
-0.0074
-0.1576
-0.0022
-0.0045
      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
0.0001
0.0008
-0.0001
-0.0006
-0.0009
      :
      :
E = 5000×1
-0.0023
-0.0010
-0.0061
-0.0004
-0.0038
-0.0000
-0.0071

```

```

-0.1361
-0.0025
-0.0041
:
:
Iteration      30 | Cost: 1.320100e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0008
-0.0001
-0.0006
-0.0009
      :
      :
E = 5000x1
-0.0022
-0.0010
-0.0060
-0.0004
-0.0037
-0.0000
-0.0069
-0.1351
-0.0024
-0.0041
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0008
-0.0001
-0.0006
-0.0009
      :
      :
E = 5000x1
-0.0022
-0.0010
-0.0057
-0.0004
-0.0035
-0.0000
-0.0067
-0.1330
-0.0023
-0.0039
      :
      :
theta = 401x1
1.0e+00 *
      0
      0

```



```

      0
    -0.0000
    -0.0000
     0.0001
     0.0008
    -0.0000
    -0.0006
    -0.0009
     :
     :
E = 5000×1
    -0.0020
    -0.0009
    -0.0051
    -0.0003
    -0.0031
    -0.0000
    -0.0059
    -0.1269
    -0.0020
    -0.0035
     :
     :
theta = 401×1
1.0e+00 *
      0
      0
      0
    -0.0000
    -0.0000
     0.0001
     0.0008
    -0.0000
    -0.0006
    -0.0009
     :
     :
E = 5000×1
    -0.0016
    -0.0007
    -0.0040
    -0.0002
    -0.0023
    -0.0000
    -0.0044
    -0.1140
    -0.0015
    -0.0028
     :
     :
Iteration    31 | Cost: 1.294498e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
    -0.0000
    -0.0000
     0.0001
     0.0008
    -0.0000
    -0.0006
    -0.0009

```

```

      :
      :
E = 5000×1
-0.0012
-0.0005
-0.0045
-0.0003
-0.0013
-0.0000
-0.0036
-0.0839
-0.0014
-0.0023
      :
      :
Iteration      32 | Cost: 1.260010e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
0.0001
0.0008
-0.0000
-0.0006
-0.0009
      :
      :
E = 5000×1
-0.0020
-0.0009
-0.0075
-0.0005
-0.0038
-0.0000
-0.0094
-0.1326
-0.0046
-0.0037
      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
0.0001
0.0008
-0.0000
-0.0006
-0.0009
      :
      :
E = 5000×1
-0.0013
-0.0005
-0.0048
-0.0003
-0.0015
-0.0000

```

```

-0.0041
-0.0890
-0.0016
-0.0024
:
:
Iteration    33 | Cost: 1.256812e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0008
-0.0000
-0.0006
-0.0009
      :
      :
E = 5000x1
-0.0011
-0.0005
-0.0043
-0.0003
-0.0014
-0.0000
-0.0038
-0.0875
-0.0015
-0.0022
      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0008
-0.0000
-0.0006
-0.0009
      :
      :
E = 5000x1
-0.0009
-0.0004
-0.0034
-0.0002
-0.0013
-0.0000
-0.0032
-0.0847
-0.0014
-0.0017
      :
      :
Iteration    34 | Cost: 1.243741e-02
theta = 401x1
1.0e+00 *

```

```

0
0
0
-0.0000
-0.0000
0.0001
0.0008
-0.0000
-0.0006
-0.0009
:
:
E = 5000×1
-0.0007
-0.0003
-0.0031
-0.0002
-0.0008
-0.0000
-0.0024
-0.0636
-0.0010
-0.0014
:
:
Iteration    35 | Cost: 1.236271e-02
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0008
-0.0000
-0.0006
-0.0009
:
:
E = 5000×1
-0.0008
-0.0003
-0.0041
-0.0002
-0.0007
-0.0000
-0.0025
-0.0527
-0.0011
-0.0015
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0008
-0.0000
-0.0006

```

```

-0.0009
:
E = 5000×1
-0.0008
-0.0003
-0.0037
-0.0002
-0.0007
-0.0000
-0.0025
-0.0566
-0.0011
-0.0015
:
Iteration 36 | Cost: 1.230295e-02
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0008
-0.0000
-0.0006
-0.0009
:
E = 5000×1
-0.0009
-0.0003
-0.0038
-0.0002
-0.0010
-0.0000
-0.0030
-0.0671
-0.0013
-0.0016
:
Iteration 37 | Cost: 1.223888e-02
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0008
-0.0000
-0.0006
-0.0009
:
E = 5000×1
-0.0008
-0.0003
-0.0028
-0.0002

```

```

-0.0010
-0.0000
-0.0026
-0.0722
-0.0011
-0.0014
:
:
Iteration      38 | Cost: 1.217592e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0008
-0.0000
-0.0006
-0.0009
:
:
E = 5000x1
-0.0010
-0.0004
-0.0026
-0.0002
-0.0016
-0.0000
-0.0033
-0.0921
-0.0014
-0.0016
:
:
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0008
-0.0000
-0.0006
-0.0009
:
:
E = 5000x1
-0.0009
-0.0003
-0.0027
-0.0002
-0.0012
-0.0000
-0.0029
-0.0806
-0.0013
-0.0015
:
:
Iteration      39 | Cost: 1.214862e-02

```

```
theta = 401x1
```

```
1.0e+00 *  
    0  
    0  
    0  
 -0.0000  
 -0.0000  
  0.0001  
  0.0008  
 -0.0000  
 -0.0006  
 -0.0009  
  ⋮  
  ⋮
```

```
E = 5000x1
```

```
 -0.0008  
 -0.0003  
 -0.0023  
 -0.0001  
 -0.0013  
 -0.0000  
 -0.0027  
 -0.0828  
 -0.0012  
 -0.0013  
  ⋮  
  ⋮
```

```
theta = 401x1
```

```
1.0e+00 *  
    0  
    0  
    0  
 -0.0000  
 -0.0000  
  0.0001  
  0.0008  
 -0.0000  
 -0.0006  
 -0.0009  
  ⋮  
  ⋮
```

```
E = 5000x1
```

```
 -0.0008  
 -0.0003  
 -0.0018  
 -0.0001  
 -0.0013  
 -0.0000  
 -0.0024  
 -0.0860  
 -0.0010  
 -0.0012  
  ⋮  
  ⋮
```

```
Iteration    40 | Cost: 1.208465e-02
```

```
theta = 401x1
```

```
1.0e+00 *  
    0  
    0  
    0  
 -0.0000  
 -0.0000  
  0.0001  
  0.0008
```

```

-0.0000
-0.0006
-0.0009
:
:
E = 5000×1
-0.0008
-0.0003
-0.0016
-0.0001
-0.0014
-0.0000
-0.0024
-0.0880
-0.0010
-0.0012
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0008
-0.0000
-0.0006
-0.0009
:
:
E = 5000×1
-0.0008
-0.0002
-0.0013
-0.0001
-0.0015
-0.0000
-0.0023
-0.0922
-0.0010
-0.0011
:
:
theta = 401×1
1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0009
-0.0000
-0.0006
-0.0009
:
:
E = 5000×1
-0.0008
-0.0002
-0.0007
-0.0001

```



```

-0.0023
-0.0000
-0.0022
-0.1058
-0.0010
-0.0010
:
:
Iteration      41 | Cost: 1.151598e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0009
 0.0000
-0.0005
-0.0009
  :
  :
E = 5000x1
-0.0004
-0.0001
-0.0002
-0.0000
-0.0015
-0.0000
-0.0008
-0.0821
-0.0004
-0.0004
  :
  :
Iteration      42 | Cost: 1.075658e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0009
 0.0000
-0.0005
-0.0009
  :
  :
E = 5000x1
-0.0004
-0.0001
-0.0003
-0.0000
-0.0006
-0.0000
-0.0007
-0.0421
-0.0003
-0.0005
  :
  :

```

Iteration 43 | Cost: 1.026278e-02

theta = 401x1

1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0009
0.0000
-0.0005
-0.0009
:
:

E = 5000x1

-0.0027
-0.0005
-0.0084
-0.0011
-0.0034
-0.0000
-0.0083
-0.0533
-0.0047
-0.0063
:
:

theta = 401x1

1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001
0.0009
0.0000
-0.0005
-0.0009
:
:

E = 5000x1

-0.0004
-0.0001
-0.0004
-0.0001
-0.0007
-0.0000
-0.0009
-0.0431
-0.0004
-0.0006
:
:

Iteration 44 | Cost: 1.021568e-02

theta = 401x1

1.0e+00 *
0
0
0
-0.0000
-0.0000
0.0001

```

    0.0009
    0.0000
   -0.0005
   -0.0009
    :
    :
E = 5000×1
   -0.0005
   -0.0001
   -0.0005
   -0.0001
   -0.0008
   -0.0000
   -0.0009
   -0.0410
   -0.0004
   -0.0007
    :
    :
Iteration    45 | Cost: 1.014042e-02
theta = 401×1
1.0e+00 *
    0
    0
    0
   -0.0000
   -0.0000
    0.0001
    0.0009
    0.0000
   -0.0005
   -0.0009
    :
    :
E = 5000×1
   -0.0003
   -0.0000
   -0.0002
   -0.0000
   -0.0004
   -0.0000
   -0.0004
   -0.0338
   -0.0002
   -0.0004
    :
    :
theta = 401×1
1.0e+00 *
    0
    0
    0
   -0.0000
   -0.0000
    0.0001
    0.0009
    0.0000
   -0.0005
   -0.0009
    :
    :
E = 5000×1
   -0.0004
   -0.0001

```

```

-0.0004
-0.0001
-0.0008
-0.0000
-0.0008
-0.0400
-0.0004
-0.0007
:
:
Iteration      46 | Cost: 1.013294e-02
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0009
 0.0000
-0.0005
-0.0009
  :
  :
E = 5000x1
-0.0004
-0.0001
-0.0004
-0.0001
-0.0008
-0.0000
-0.0008
-0.0410
-0.0004
-0.0007
  :
  :
theta = 401x1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
 0.0001
 0.0009
 0.0000
-0.0005
-0.0009
  :
  :
E = 5000x1
-0.0004
-0.0001
-0.0004
-0.0001
-0.0008
-0.0000
-0.0007
-0.0431
-0.0004
-0.0006

```

```

      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000
      0.0001
      0.0009
      0.0000
     -0.0005
     -0.0009
      :
      :
E = 5000×1
     -0.0004
     -0.0001
     -0.0003
     -0.0001
     -0.0008
     -0.0000
     -0.0006
     -0.0485
     -0.0003
     -0.0005
      :
      :
Iteration    47 | Cost: 1.007522e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000
      0.0001
      0.0009
      0.0000
     -0.0005
     -0.0009
      :
      :
E = 5000×1
     -0.0006
     -0.0001
     -0.0005
     -0.0001
     -0.0011
     -0.0000
     -0.0009
     -0.0581
     -0.0005
     -0.0008
      :
      :
theta = 401×1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000

```

```

0.0001
0.0009
0.0000
-0.0005
-0.0009
:
:
E = 5000×1
-0.0005
-0.0001
-0.0003
-0.0001
-0.0008
-0.0000
-0.0007
-0.0510
-0.0004
-0.0006
:
:
Iteration      48 | Cost: 1.005983e-02
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
0.0001
0.0009
0.0000
-0.0005
-0.0009
:
:
E = 5000×1
-0.0004
-0.0001
-0.0004
-0.0001
-0.0008
-0.0000
-0.0007
-0.0494
-0.0004
-0.0006
:
:
theta = 401×1
1.0e+00 *
      0
      0
      0
-0.0000
-0.0000
0.0001
0.0009
0.0000
-0.0005
-0.0009
:
:
E = 5000×1
-0.0004

```

```

-0.0001
-0.0004
-0.0001
-0.0007
-0.0000
-0.0006
-0.0466
-0.0003
-0.0006
:
:
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
-0.0000
0.0001
0.0009
0.0000
-0.0005
-0.0009
:
:
E = 5000x1
-0.0004
-0.0001
-0.0004
-0.0001
-0.0006
-0.0000
-0.0005
-0.0390
-0.0003
-0.0006
:
:
Iteration    49 | Cost: 9.923725e-03
theta = 401x1
1.0e+00 *
    0
    0
    0
-0.0000
-0.0000
0.0001
0.0009
0.0001
-0.0005
-0.0008
:
:
E = 5000x1
-0.0003
-0.0000
-0.0002
-0.0000
-0.0004
-0.0000
-0.0003
-0.0289
-0.0001
-0.0004

```

```

      :
      :
theta = 401x1
1.0e+00 *
      0
      0
      0
     -0.0000
     -0.0000
      0.0001
      0.0009
      0.0000
     -0.0005
     -0.0009
      :
      :
E = 5000x1
     -0.0004
     -0.0001
     -0.0003
     -0.0001
     -0.0005
     -0.0000
     -0.0004
     -0.0352
     -0.0002
     -0.0005
      :
      :
Iteration      50 | Cost: 9.875664e-03

```

*You should now submit your solutions. Enter **submit** at the command prompt, then enter or confirm your login and token when prompted.*

1.4.1 One-vs-all prediction

After training your one-vs-all classifier, you can now use it to predict the digit contained in a given image. For each input, you should compute the 'probability' that it belongs to each class using the trained logistic regression classifiers. Your one-vs-all prediction function will pick the class for which the corresponding logistic regression classifier outputs the highest probability and return the class label (1, 2, ..., or K) as the prediction for the input example.

You should now complete the code in `predictOneVsAll.m` to use the one-vs-all classifier to make predictions. Once you are done, run the code below to call your `predictOneVsAll` function using the learned value of Θ . You should see that the training set accuracy is about 94.9% (i.e., it classifies 94.9% of the examples in the training set correctly).

```

pred = predictOneVsAll(all_theta, X);
fprintf('\nTraining Set Accuracy: %f\n', mean(double(pred == y)) * 100);

```

```

Training Set Accuracy: 95.120000

```

*You should now submit your solutions. Enter **submit** at the command prompt, then enter or confirm your login and token when prompted.*

2. Neural Networks

In the previous part of this exercise, you implemented multi-class logistic regression to recognize handwritten digits. However, logistic regression cannot form more complex hypotheses as it is only a linear classifier. (You could add more features such as polynomial features to logistic regression, but that can be very expensive to train.) In this part of the exercise, you will implement a neural network to recognize handwritten digits using the same training set as before. The neural network will be able to represent complex models that form non-linear hypotheses.

For this week, you will be using parameters from a neural network that we have already trained. Your goal is to implement the feedforward propagation algorithm to use our weights for prediction. In next week's exercise, you will write the backpropagation algorithm for learning the neural network parameters.

2.1 Model representation

Our neural network is shown in Figure 2. It has 3 layers- an input layer, a hidden layer and an output layer. Recall that our inputs are pixel values of digit images. Since the images are of size 20 x 20, this gives us 400 input layer units (excluding the extra bias unit which always outputs +1). As before, the training data will be loaded into the variables x and y .

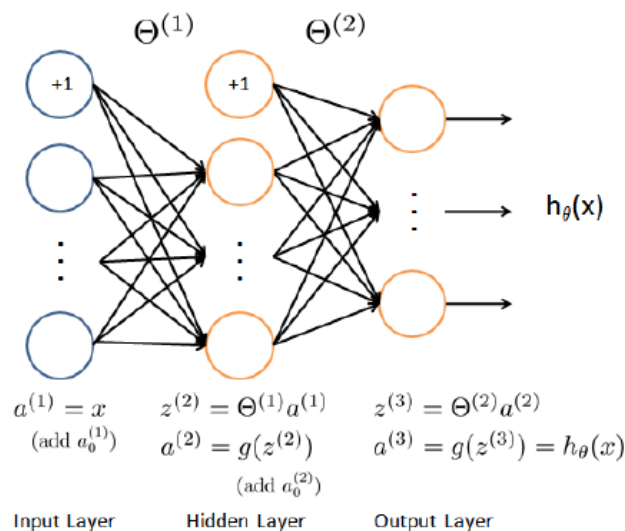


Figure 2: Neural network model.

You have been provided with a set of network parameters $(\Theta^{(1)}, \Theta^{(2)})$ already trained by us. These are stored in `ex3weights.mat` and are loaded into `Theta1` and `Theta2` by running the code below. The parameters have dimensions that are sized for a neural network with 25 units in the second layer and 10 output units (corresponding to the 10 digit classes).

```
load('ex3data1.mat');
m = size(X, 1);

% Randomly select 100 data points to display
sel = randperm(size(X, 1));
sel = sel(1:100);
```

```
displayData(X(sel, :));
```



```
% Load saved matrices from file
load('ex3weights.mat');
% Theta1 has size 25 x 401
% Theta2 has size 10 x 26
```

2.2 Feedforward propagation and prediction

Now you will implement feedforward propagation for the neural network. You will need to complete the code in `predict.m` to return the neural network's prediction. You should implement the feedforward computation that computes $h_{\theta}(x^{(i)})$ for every example i and returns the associated predictions. Similar to the one-vs-all classification strategy, the prediction from the neural network will be the label that has the largest output $(h_{\theta}(x))_k$.

Implementation Note: The matrix `x` contains the examples in rows. When you complete the code in `predict.m`, you will need to add the column of 1's to the matrix. The matrices `Theta1` and `Theta2` contain the parameters for each unit in rows. Specically, the first row of `Theta1` corresponds to the first hidden unit in the second layer. In MATLAB, when you compute $z^{(2)} = \Theta^{(1)}a^{(1)}$, be sure that you index (and if necessary, transpose) `x` correctly so that you get $a^{(1)}$ as a column vector.

Once you are done, run the code below to call your predict function using the loaded set of parameters for Theta1 and Theta2. You should see that the accuracy is about 97.5%.

```
pred = predict(Theta1, Theta2, X);  
fprintf('\nTraining Set Accuracy: %f\n', mean(double(pred == y)) * 100);
```

Training Set Accuracy: 97.520000

The code below will displaying images from the training set one at a time, while the console prints out the predicted label for the displayed image. Rerun to repeat with another image.

```
% Randomly permute examples  
rp = randi(m);  
% Predict  
pred = predict(Theta1, Theta2, X(rp,:));  
fprintf('\nNeural Network Prediction: %d (digit %d)\n', pred, mod(pred, 10));
```

Neural Network Prediction: 4 (digit 4)

```
% Display  
displayData(X(rp, :));
```



*You should now submit your solutions. Enter **submit** at the command prompt, then enter or confirm your login and token when prompted.*

Submission and Grading

After completing this assignment, be sure to use the submit function to submit your solutions to our servers. The following is a breakdown of how each part of this exercise is scored.

Part	Submitted File	Points
Regularized Logistic Regression	<code>lrCostFunction.m</code>	30 points
One-vs-all classifier training	<code>oneVsAll.m</code>	20 points
One-vs-all classifier prediction	<code>predictOneVsAll.m</code>	20 points
Neural Network Prediction Function	<code>predict.m</code>	30 points
Total Points		100 points

You are allowed to submit your solutions multiple times, and we will take only the highest score into consideration.