**General Sturm-Liouville Eigenvalue Problem (SLEP)**

**Numerical Solution**

General SLEP:

Domain:

Chart, scatter chart

Description automatically generated

Use central difference method to approximate and :

Let

**Dirichlet BC**

Boundary Condition (BC):

For

Say (BC)

In matrix form ( means element-wise multiplication),

Let

Then

For

In matrix form,

Let

Then

For

In matrix form,

Let

Then

For

In matrix form,

Let

Then,

Becomes

This is an eigenvalue problem!

“SLEP.m” solves general SLEP by solving this eigenvalue problem.

**Neumann BC**

Boundary Condition (BC):

,

For

For

In matrix form,

**Mixed BC**

Boundary Condition (BC):

At the boundary,

For

For

In matrix form,