

I. Diffusion filters:

1. Let us consider a diffusion operator (filter),

$$R_T = e^{-TL}.$$

Where L is the Laplacian matrix of a given Minnesota graph G and choose $T = [1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7]$.

Calculate the output $R_T x$, of each of these diffusion operator for a given signal $x(n)$, defined on a graph G , where

$$R_T x = (e^{-TL})x = x * (D_T g), \quad \widehat{D_T g} = \hat{g}(T\lambda) \text{ and consider}$$

- $x(n) = \delta_{100}$
 - $x(n) = 1.$
- a. Plot the output of these filters on the Minnesota graph.
 - b. Plot the output of the filters in a 3D plot. (Hint: use *mesh()* keyword in MATLAB)
 - c. Plot the output of the filters in a 2D plot. (Hint: use *imagesc()* keyword in MATLAB)