```
%-- 2023-06-08 12:13 PM --%
incising.m
incising
incising.m
run incising.m
incising
%-- 2023-06-19 1:59 PM --%
cd
cd C:\Users\maggi\Documents\SchoolStuff\ESROP\SupraglacialStreams\MATLAB
cd
cd C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB
ld C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB
pwd
cd "C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB"
cd 'C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB'
pwd
integral_method.m
integral_method
length(t)
length(u(1,:))
integral_method
u(0)
u(1)
u(1, :)
integral_method
u(1,1)
integral_method
u(1,1)
Q(1)
Q(:,1)
Q(1,:)
integral_method
plot(x, h(1,:), x, h(2,:), h(10,:))
plot(x, h(1,:))
plot(x, h(2,:))
plot(x, h(10,:))
plot(x, h(1,:), x,h(10,:), x, h(500, :))
plot(x, u(1,:))
plot(x, u(10,:))
plot(x, u(500,:))
plot(x, u(1, :), x, u(500,:))
plot(x, u(1, :), x, u(500,:), x, u(1000, :))
integral_method
plot(x, h(1, :), x, h(10, :))
integral_method
plot(x, h(1, :), x, h(10, :))
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
plot(x, S(1, :), x, S(100, :), x, S(500, :), x, S(1000, :))
integral_method
```

```
plot(x, S(1, :), x, S(100, :), x, S(500, :), x, S(1000, :))
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
plot(x, h(1, :), x, h(1000, :), x, h(5000, :), x, h(10000, :))
integral_method
plot(x, h(1, :), x, h(1000, :), x, h(5000, :), x, h(10000, :))
integral_method
plot(x, h(1, :), x, h(1000, :), x, h(5000, :), x, h(10000, :))
integral_method
plot(x, h(1, :), x, h(1000, :), x, h(5000, :), x, h(10000, :))
integral_method
plot(x, h(1, :), x, h(1000, :), x, h(5000, :), x, h(10000, :))
integral_method
plot(x, h(1, :), x, h(1000, :), x, h(5000, :), x, h(10000, :))
integral_method
plot(x, h(1, :), x, h(1000, :), x, h(5000, :), x, h(10000, :))
integral_method
w_cur
integral_method
plot(x, u(1, :), x, u(5, :), x, u(10, :))
integral_method
plot(x, u(1, :), x, u(5, :), x, u(10, :))
plot(x, h(1, :), x, h(1000, :), x, h(5000, :), x, h(10000, :))
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
plot(x, h(1, :), x, h(50, :), x, h(100, :), x, h(200, :))
integral_method
plot(x, u(1, :), x, u(5, :), x, u(10, :))
integral_method
plot(x, h(1, :), x, h(50, :), x, h(100, :), x, h(200, :))
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
integral_method
plot(x, u(1, :), x, u(5, :), x, u(10, :))
```

```
plot(x, u(1, :), x, u(100, :), x, u(500, :))
integral_method
plot(x, u(1, :), x, u(100, :), x, u(500, :))
plot(x, u(1, :), x, u(100, :), x, u(100, :))
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(70, :))
plot(x, h(1, :), x, h(10, :), x, h(20, :), x, h(70, :))
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(100, :))
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :), x, h(100, :), x, h(500, :), x, h(1000, :))
plot(x, h(1, :), x, h(20, :), x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :), x, h(20, :), x, h(500, :), x, h(1000, :))
plot(x, h(1, :), x, h(200, :), x, h(500, :), x, h(1000, :))
plot(x, h(1, :), x, h(200, :), x, h(500, :))
integral_method
plot(x, h(1, :), x, h(200, :), x, h(500, :))
integral_method
plot(x, h(1, :), x, h(200, :), x, h(500, :))
plot(x, h(1, :), x, h(200, :), x, h(500, :), x, h(1000, :))
plot(x, h(1, :), x, h(10, :), x, h(20, :), x, h(100, :))
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
plot(x, h(1, :), x, h(2, :), x, h(3, :), x, h(4, :))
integral_method
plot(x, h(1, :), x, h(2, :), x, h(3, :), x, h(4, :))
plot(x, h(1, :), x, h(10, :), x, h(50, :), x, h(100, :))
plot(x, h(1, :), x, h(50, :), x, h(100, :), x, h(500, :))
plot(x, h(1, :), x, h(50, :), x, h(100, :), x, h(700, :))
plot(x, h(1, :),  x, h(10, :), x, h(50, :), x, h(100, :), x, h(500, :))
integral_method
plot(x, h(1, :),  x, h(10, :), x, h(50, :), x, h(100, :), x, h(500, :))
integral_method
plot(x, h(1, :),  x, h(10, :), x, h(50, :), x, h(100, :), x, h(500, :))
plot(x, h(1, :),  x, h(2, :), x, h(3, :), x, h(4, :), x, h(5, :))
```

```
plot(x, h(1, :),  x, h(2, :))
integral_method
plot(x, h(1, :),  x, h(2, :))
plot(x, h(1, :),  x, h(10, :))
integral_method
plot(x, h(1, :),  x, h(10, :))
plot(x, h(1, :),  x, h(10, :),  x, h(50, :), x, h(100, :),)
plot(x, h(1, :),  x, h(10, :),  x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(50, :), x, h(100, :))
plot(x, h(1, :),  x, h(10, :),  x, h(500, :), x, h(1000, :))
plot(x, h(1, :),  x, h(10, :),  x, h(50, :), x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(500, :), x, h(1000, :))
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(500, :), x, h(1000, :))
plot3(x,t,h)
plot3(t,x,h)
surf(t,x,h)
surf(x,t,h)
plotter
plotter(x,t,h)
h
plotter(h,x,t)
plot(x, h(1, :),  x, h(10, :),  x, h(500, :), x, h(1000, :))
plotter(h,t,x)
plotter(h,x,t)
```

```matlab
integral_method
plotter(h,x,t)
integral_method
plotter(h,x,t)
integral_method
plotter(h,x,t)
integral_method
plotter(h,x,t)
integral_method
plotter(h,x,t)
%-- 2023-06-21 9:15 AM --%
integral_method
plotter(h,x,t)
plotter(w,x,t)
integral_method
plotter(w,x,t)
integral_method
plotter(w,x,t)
integral_method
plotter(w,x,t)
integral_method
plotter(w,x,t)
integral_method
plotter(w,x,t)
integral_method
plotter(w,x,t)
plotter(h,x,t)
plot(x, h(1, :),  x, h(10, :),  x, h(500, :), x, h(1000, :))
T = csvimport("Discharge_timeseries.csv", "columns", "Discharge [m3/s]");
T = readtable("Discharge_timerseries.csv")
T = readtable("RawData/Discharge_timerseries.csv")
T = readtable("RawData\Discharge_timerseries.csv")
T = readtable("Discharge_timeseries.csv")
T(5)
T(5,:)
T(:,5)
y = T(:,5)
y = vec(y)
y = table2array(y)
integral_method
T = readtable("RawData/Discharge_profiles.csv")
integral_method
addpath 'C:\Users\maggi\Documents\School↵
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\HelperFunctions'
integral_method
plot(x, h(1, :),  x, h(10, :),  x, h(500, :), x, h(1000, :))
plot(x, h(1, :),  x, h(1000, :),  x, h(5000, :), x, h(10000, :))
plot(x, h(1, :),  x, h(1000, :),  x, h(5000, :))
plotter(h,x,t)
integral_method
plotter(h,x,t)
```

```
plot(x, h(1, :),   x, h(1000, :),   x, h(5000, :))
%-- 2023-06-21 11:01 AM --%
integral_method
addpath 'C:\Users\maggi\Documents\School↵
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\HelperFunctions'
integral_method
x+vt
x+v*t
integral_method
plot(x, h(1, :),   x, h(1000, :),   x, h(5000, :))
plot(x, u(1, :),   x, u(5, :),   x, u(10, :))
h = zeros([nt,nx]);
h(1,:) = h_init;
h(2, :) = h(1,:) + dt.*(-u(1,:).^(-6).*Q(1,:).^(3/5) + 2*(Q(1,:).^(2/5).*u(1,:) - Q↵
(1,:).^(2/5).*u(1,:))/dt);
h(2, :) = h(1,:) + dt.*(-u(2,:).^(-6).*Q(2,:).^(3/5) + 2*(Q(2,:).^(2/5).*u(2,:) - Q↵
(1,:).^(2/5).*u(1,:))/dt);
h(3, :) = h(2,:) + dt.*(-u(3,:).^(-6).*Q(3,:).^(3/5) + 2*(Q(3,:).^(2/5).*u(3,:) - Q↵
(2,:).^(2/5).*u(2,:))/dt);
plot(x, u(1, :),   x, u(2, :),   x, u(3, :))
plot(x, h(1, :),   x, h(2, :),   x, h(3, :))
integral_method
plot(x, u(1, :),   x, u(5, :),   x, u(10, :))
plot(x, h(1, :),   x, h(50, :),   x, h(100, :))
plot(x, h(1, :),   x, h(500, :),   x, h(1000, :))
integral_method
plot(x, h(1, :),   x, h(50, :),   x, h(100, :))
plot(x, h(1, :),   x, h(500, :),   x, h(1000, :))
plot(x, h(1, 1:100),   x, h(500, 1:100),   x, h(1000, 1:100))
plot(x(1:100), h(1, 1:100),   x(1:100), h(500, 1:100),   x(1:100), h(1000, 1:100))
integral_method
cd 'C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB'
integral_method
plot(x(1:100), h(1, 1:100),   x(1:100), h(500, 1:100),   x(1:100), h(1000, 1:100))
plot(x(1:100), h(1, 1:100),   x(1:100), h(5, 1:100),   x(1:100), h(10, 1:100))
plot(x(1:100), h(1, 1:100),   x(1:100), h(10, 1:100),   x(1:100), h(100, 1:100))
plot(x(1:100), h(1, 1:100),   x(1:100), h(5, 1:100),   x(1:100), h(10, 1:100))
plotter(h,x,t)
plotter(h(:,1:100),x(1:100),t)
plotter(h(:,1:1000),x(1:1000),t)
plotter(h(:,1:200),x(1:200),t)
integral_method
integral_method\
integral_method
addpath 'C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB'
integral_method
plotter(h(:,1:200),x(1:200),t)
integral_method
plotter(h(:,1:200),x(1:200),t)
integral_method
plotter(h(:,1:200),x(1:200),t)
```

```
plot(x(1:100), h(1, 1:100),  x(1:100), h(5, 1:100),  x(1:100), h(10, 1:100))
plot(x, h(1, 1:100),  x, h(500, 1:100),  x, h(1000, 1:100))
plot(x, h(1, :),  x, h(500, :),  x, h(1000, :))
plot(x, h(1, :),  x, h(10, :),  x, h(100, :))
plot(x, h(1, :),  x, h(2, :),  x, h(3, :))
integral_method
plot(x, h(1, :),  x, h(2, :),  x, h(3, :))
integral_method
plot(x, h(1, :),  x, h(2, :),  x, h(3, :))
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
integral_method\
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))\
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
```

```
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
y = Q - 4/5.*Qt
y = Q.^(6/5) - 4/5.*Qt
plot(t, Q(1,:))
plot(t, Q(:, 1))
plot(t(50,100), Q(:, 50:100))
plot(t(50:100), Q(:, 50:100))
plot(t(50,100), Q(50:100, :))
plot(t(50:100), Q(50:100, :))
plot(x, u(1, :),  x, u(50, :),  x, u(100, :))
plot(x, u(10, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
integral_method
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
plot(x, u(1, :), x, u(50, :), x, u(100, :))
integral_method
plot(x, u(1, :), x, u(50, :), x, u(100, :))
integral_method
plot(x, u(1, :), x, u(50, :), x, u(100, :))
plot(x, h(1, :),  x, h(50, :),  x, h(100, :))
plot(x, h(1, :),  x, h(2, :),   x, h(3, :))
plot(x, h(1, :))
integral_method
plot(x, h(1, :))
plot(x, h(2, :))
plot(x, h(3, :))
integral_method
plot(x, h(2, :))
plot(x, h(1,:), x, h(2, :))
integral_method
plot(x, h(1,:), x, h(2, :))
integral_method
plot(x, h(1,:), x, h(2, :))
plot(x(1:100), h(1,1:100), x, h(2, 1:100))
plot(x(1:100), h(1,1:100), x(1:100), h(2, 1:100))
plot(x(1:500), h(1,1:500), x(1:500), h(2, 1:500))
plot(x(1:500), h(1,1:500), x(1:500), h(4, 1:500))
plot(x(1:500), h(1,1:500), x(1:500), h(4, 1:500), x(1:500), h(10, 1:500), x(1:500), h↙
(50, 1:500))
```

```
plot(x(1:600), h(1,1:600), x(1:600), h(4, 1:600), x(1:600), h(10, 1:600), x(1:600), h↵
(50, 1:600))
plotter(h(:,1:550),x(1:550),t)
integral_method
plotter(h(:,1:550),x(1:550),t)
integral_method
plotter(h(:,1:550),x(1:550),t)
plot(x, h(1,:), x, h(2, :))
plot(x(1:100), h(1,1:100), x(1:100), h(2, 1:100))
plot(x(1:400), h(1,1:400), x(1:400), h(2, 1:400))
plot(x(1:400), h(1,1:400), x(1:400), h(5, 1:400))
integral_method
plot(x(1:400), h(1,1:400), x(1:400), h(5, 1:400))
plot(x(1:400), h(1,1:400), x(1:400), h(2, 1:400))
plot(x(1:400), h(1,1:400), x(1:400), h(3, 1:400))
plot(x(1:400), h(1,1:400), x(1:400), h(4, 1:400))
plot(x, h(1,:), x, h(2, :))
integral_method
plot(x, h(1,:), x, h(2, :))
integral_method
plot(x, h(1,:), x, h(2, :))
integral_method
plot(x, h(1,:), x, h(2, :))
integral_method
plot(x, h(1,:), x, h(2, :))
plot(x, h(1,:), x, h(3, :))
integral_method
plot(x, h(1,:), x, h(3, :))
integral_method
plot(x, h(1,:), x, h(3, :))
integral_method
plot(x(1:500), u(1,1:500), x(1:500), u(3, 1:500))
plot(x(1:500), u(1,1:500), x(1:500), u(2, 1:500))
plot(x, h_init, t, h_x_0)
integral_method
plot(x, h_init, t, h_x_0)
plot(x(1:500), u(1,1:500), x(1:500), u(2, 1:500))
plotter(u, x, t)
plot(x, h(1,:), x, h(3, :))
plot(x, h(1,:), x, h(100, :))
plot(x, h(1,:), x, h(1000, :))
plotter(h, x, t)
integral_method
plotter(u, x, t)
plot(x, h(1,:), x, h(1000, :))
plot(x, h(1,:), x, h(500, :),x, h(1000, :))
plot(x, h(1,:), x, h(800, :),x, h(1000, :))
integral_method
plot(x, h(1,:), x, h(800, :),x, h(1000, :))
S(1000,:)
plot(t, S(1000,:)
```

```
plot(t, S(1000,:))
integral_method
plot(t, S(1000,:))
integral_method
plot(t, S(1000,:))
integral_method
plot(t, S(1000,:))
plot(t, S(100,:))
integral_method
plot(t, S(1000,:))
plot(x, h(1,:), x, h(800, :),x, h(1000, :))
plot(t, h(1,:))
plot(t, h(:,1))
plotter(u, x, t)
plotter(h, x, t)
integral_method
plotter(h, x, t)
plotter(u, x, t)\
plotter(u, x, t)
plot(x, h(1,:), x, h(800, :),x, h(1000, :))
plot(x, h(1,:), x, h(80, :),x, h(100, :))
integral_method
plotter(u, x, t)
integral_method
plotter(u, x, t)
integral_method
plotter(u, x, t)
integral_method
plotter(u, x, t)
plot(x, h(1,:), x, h(800, :),x, h(1000, :))\
plot(x, h(1,:), x, h(800, :),x, h(1000, :))
plot(x, h(1,:), x, h(8, :),x, h(10, :))
integral_method
plot(x, h(1,:), x, h(8, :),x, h(10, :))
integral_method
plot(x, h(1,:), x, h(8, :),x, h(10, :))
integral_method
plot(x, h(1,:), x, h(8, :),x, h(10, :))
integral_method
plot(x, h(1,:), x, h(8, :),x, h(10, :))
plotter(h, x, t)
integral_method
plotter(h, x, t)
plot(t, u(:, 1))
plot(t, u(:, 3))
integral_method
plot(t, u(:, 3))
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
```

```matlab
plotter(h, x, t)
plot(x, h(1,:), x, h(8, :),x, h(10, :))
plot(x, S(1,:), x, S(8, :),x, S(10, :))
h_new = zeros([nt, nx])
h_new(:, 1) = h_init
h_new(1, :) = h_init
h_new(:, 1) = h_x_0;
h_new(1, :) = h_x_0;
integral_method
plot(x, S(1,:), x, S(8, :),x, S(10, :))
plot(x, h(1,:), x, h(8, :),x, h(10, :))
h_new = zeros([nt, nx])
h_new(1, :) = h_init
h_new(1, :) = h_x_0;
h_new(:, 1) = h_x_0;
for i = 2:nx
h_new(:, i) = h_new(:, i-1) + dx*S(:, i-1);
end
plot(x, h_new(1,:), x, h_new(8, :),x, h_new(10, :))
plot(x, h_new(1,:), x, h_new(80, :),x, h_new(100, :))
integral_method
for i = 2:nx
h_new(:, i) = h_new(:, i-1) + dx*S(:, i-1);
end
plot(x, h_new(1,:), x, h_new(80, :),x, h_new(100, :))
integral_method
h_new = zeros([nt, nx])
h_new(1, :) = h_init
h_new(:, 1) = h_x_0;
for i = 2:nx
h_new(:, i) = h_new(:, i-1) + dx*S(:, i-1);
end
plot(x, h_new(1,:), x, h_new(80, :),x, h_new(100, :))
integral_method
plot(x, h(1,:), x, h(80, :),x, h(100, :))
integral_method
plotter(h, x, t)
plot(x, h(1,:), x, h(80, :),x, h(100, :))
plotter(S, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
plot(x, h(1,:), x, h(2,:))
integral_method
plotter(h, x, t)
integral_method
plot(x, u(1,:), x, u(2,:))
integral_method
plot(x, u(1,:), x, u(2,:))
plot(x, h(1,:), x, h(2,:))
```

```
plot(x, S(1,:), x, S(2, :))
integral_method
plot(x, S(1,:), x, S(2, :))
plotter(S, x, t)
plotter(h, x, t)
plot(x, h(1,:), x, h(2,:))
plot(x, h(1,:), x, h(1000,:))
integral_method
plot(x, h(1,:), x, h(1000,:))
integral_method
plot(x, h(1,:), x, h(1000,:))
plot(x, h(1,:), x, h(10,:))
plotter(h,x, )
plotter(h,x,t)
integral_method
plotter(h,x,t)
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(1000,:))
integral_method
plotter(h,x,t)
integral_method
plotter(S,x,t)
plotter(real(S),x,t)
plot(x, S(1,:), x, S(2,:))
integral_method
plot(x, S(1,:), x, S(2,:))
plotter(h,x,t)
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(1000,:))
integral_method
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(1000,:))
integral_method
plotter(h,x,t)
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(1000,:))
integral_method
plotter(h,x,t)
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(1000,:))
plotter(h,x,t)
integral_method
plotter(h,x,t)
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(1000,:))
plot(x, h(1,:), x, h(500, :), x, h(1000,:))
plotter(h,x,t)
integral_method
plotter(h,x,t)
integral_method
plot(x, u(1,:), x, u(50, :))
plot(x, u(1,:), x, u(5, :))
integral_method
plot(x, u(1,:), x, u(50, :))
plotter(h,x,t)
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
plot(t, Qt(:,1)
```

```
plot(t, Qt(:,1))
integral_method
plotter(h,x,t)
integral_method
plotter(h,x,t)
integral_method
plotter(h,x,t)
plotter(u,x,t);
integral_method
plotter(u,x,t);
z = Qt./Q;
plot(z, x, t)
plotter(z, x, t);
plot(t, z(:, 1));
z = Qt./Q.^(2/5);
plot(t, z(:, 1));
z = Qt./(Q.^(2/5).*u);
plot(t, z(:, 1));
integral_method
plot(t, z(:, 1));
plotter(h,x,t)
plot(w, x, t)
plotter(w,x,t)
plot(t, abs(Q(:, 1)));
abs(Q(:, 1));
plot(t, absQ(:, 1));
plot(t, Q(:, 1));
plot(t, abs(Qt(:, 1)));
plot(t, Qt(:,1), t, abs(Qt(:, 1)));
integral_method
plot(h, x, t)
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
```

```matlab
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
plotter(S, x, t)
y = h
y(1,:) = h_x_0;
for i = 2:nx
end
y(:, 1) = h_x_0;
for i = 2:nx
y(:, i) = y(:, i-1) +dx.*S(:, i-1);
end
plotter(y, x, t)
plot(x, y(1,:), x, y(10, :), x, y(50, :), x, y(100,:))
integral_method
plotter(S, x, t)
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
plotter(S, x, t)
plotter(abs(S), x, t)
integral_method
plotter(u, x, t)
integral_method
plotter(u, x, t)
plotter(h, x, t)
integral_method
plotter(h, x, t)
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
%-- 2023-06-23 9:59 AM --%
integral_method
addpath 'C:\Users\maggi\Documents\School ↙
```

Stuff\ESROP\Code\SupraglacialStreams\MATLAB\HelperFunctions'
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
plot(x, h(1,:), x, h(10, :), x, h(500, :), x, h(1000,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(500, :), x, h(1000,:))
integral_method
cd 'C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB'
integral_method\
integral_method
plot(x, h(1,:), x, h(10, :), x, h(500, :), x, h(1000,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(500, :), x, h(1000,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(500, :), x, h(1000,:))
plotter(h, x, t)
integral_method
plotter(h, x, t)
plot(x, h(1,:), x, h(10, :), x, h(500, :), x, h(1000,:))
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))

```
plotter(h, x, t)
integral_method
plotter(h, x, t)
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
plotter(h, x, t)
integral_method
plot(x, u(1,:), x, u(10, :), x, u(50, :))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, u(1,:), x, u(2, :), x, u(3, :))
integral_method
plot(x, u(1,:), x, u(2, :), x, u(3, :))
plotter(u, x, t)
integral_method
plotter(u, x, t)
integral_method
plotter(u, x, t)
integral_method
plotter(u, x, t)
integral_method
plotter(u, x, t)
plotter(h,x,t)
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
plotter(h, x, t)
plot(x, h(1,:), x, h(10, :), x, h(100, :), x, h(500,:))
integral_method
plotter(u, x, t)
integral_method
```

```
plotter(h, x, t)
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(1000,:))
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(100,:))
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
plotter(h, x, t)
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
plot(S, x, t)
plotter(S, x, t)
plotter(real(S), x, t)
integral_method
plotter(S, x, t)
plotter(real(S), x, t)
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
plotter(h,x,t)
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
integral_method
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(80,:))
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
integral_method
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
plotter(S, x,t)
```

```
plotter(real(S), x,t)
plotter(real(S(1:100,1:100)), x(1:100),t(1:100))
plotter(real(S(1:10,1:10)), x(1:10),t(1:10))
plot(x, h(1,:), x-v*100, h(100, :))
plot(x, h(1,:), x_shift, h(100, :))
plot(x, h(1,:), x .- v*100, h(100, :))
x = v*100
x
t
integral_method
x
x - vt
x - v*100
plot(x, h(1,:), x-v*100, h(100, :))
plot(x, h(1,:), x+v*100, h(100, :))
plot(x, h(1,:), x+v*t(100), h(100, :))
t(100)
v*t(100)
integral_method\
integral_method
v*t(100)
x-v*t(100)
plotter(h,x,t)
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
plot(x, h(1,:), x-v*t(100), h(100, :))
integral_method
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
plot(x, h(1,:), x-v*t(100), h(100, :))
v*t(100)
x-v*t(100)
plot(x, h(1,:), x-v*t(100), h(100, :))
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
integral_method
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
plot(x, h(1,:), x-v*t(100), h(100, :))
integral_method
plot(x, h(1,:), x-v*t(100), h(100, :))
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
integral_method
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
plot(x, h(1,:))
integral_method
plot(x, h(1,:))
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
integral_method
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
plot(x, S(1,:), x, S(100, :), x, S(500, :), x, S(800,:))
integral_method
plot(x, h(1,:))
integral_method
plot(x, h(1,:))
```

```
plotter(h,x,t)
plotter(S,x,t)
plotter(real(S),x,t)
integral_method
plotter(real(S),x,t)
integral_method
plotter(real(S),x,t)
plotter(h,x,t)
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
integral_method
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(800,:))
integral_method
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(1000,:))
integral_method
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(1000,:))
plot(x, h(1,:), x, h(100, :))
plot(x, h(1,:), x, h(10, :))
plot(x, h(1,:), x, h(1, :))
plot(x, h(1,:), x, h(5, :))
integral_method
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(1000,:))
integral_method
plotter(u)
plotter(u, x, t)
integral_method
plot(x, h(1,:), x, h(100, :), x, h(500, :), x, h(1000,:))
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
```

```
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
plot(x, h(1,:), x, h(5, :), x, h(10, :), x, h(20,:))
plot(x, h(1,:), x, h(5, :), x, h(10, :), x, h(72,:))
integral_method
plot(x, h(1,:), x, h(5, :), x, h(10, :), x, h(72,:))
plot(x, h(1,:), x, h(5, :), x, h(10, :), x, h(720,:))
plot(x, h(1,:), x, h(720,:))
integral_method
plot(x, h(1,:), x, h(720,:))
plot(x, h(1,:), x, h(5, :), x, h(10, :), x, h(20,:))
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
integral_method
%-- 2023-06-26 10:21 AM --%
integral_method
addpath 'C:\Users\maggi\Documents\School ↵
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\HelperFunctions'
integral_method
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(720,:))
plotter(h_ref, x, t)
integral_method
plotter(h_ref, x, t)
plot(x, h_ref(1,:), x, h_ref(720,:))
plot(x, h(1,:), x, h(2, :), x, h(3, :), x, h(4,:))
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(720,:))
integral_method
plotter(u, x, t)
integral_method
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(720,:))
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(720,:))
integral_method
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(720,:))
integral_method
```

```
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(720,:))
plotter(u, x, t)
plotter(h_ref, x, t)
plot(x, h_ref(1,:), x, h_ref(500,:),x , h_ref(600,:), x, h_ref(700,:))
integral_method
plot(x, h_ref(1,:), x, h_ref(500,:),x , h_ref(600,:), x, h_ref(700,:))
plotter(h_ref, x, t)
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(500,:),x , h_ref(600,:), x, h_ref(700,:))
plotter(h_ref, x, t)
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(1000,:))
integral_method
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(1000,:))
plot(x, h_ref(1,:))
plotter(h_ref, x, t)
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(1000,:))
integral_method
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(1000,:))
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(1000,:))
integral_method
h_ref = 10-h
integral_method
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(1000,:))
integral_method
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(1000,:))
plotter(h_ref, x, t)
integral_method
plotter(u, x, t)
integral_method
plotter(u, x, t)
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(1000,:))
integral_method
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(1000,:))
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(200,:), x, h_ref(400,:))
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(125,:), x, h_ref(150,:))
plot(x, h_ref(100,:), x, h_ref(110,:),x , h_ref(130,:), x, h_ref(150,:))
plot(x, h_ref(100,:), x, h_ref(130,:),x , h_ref(140,:), x, h_ref(150,:))
integral_method
plotter(u, x, t)
integral_method
plotter(u, x, t)
h_ref = 10-h
plot(x, h_ref(100,:), x, h_ref(130,:),x , h_ref(140,:), x, h_ref(150,:))
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(1000,:))
integral_method
```

```
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(100,:),x , h_ref(500,:), x, h_ref(1000,:))
plot(x, h_ref(1,:), x, h_ref(10,:),x , h_ref(50,:), x, h_ref(000,:))
plot(x, h_ref(1,:), x, h_ref(10,:),x , h_ref(50,:), x, h_ref(100,:))
integral_method
plot(x, h_ref(1,:), x, h_ref(10,:),x , h_ref(50,:), x, h_ref(100,:))
h_ref = 10-h
plot(x, h_ref(1,:), x, h_ref(10,:),x , h_ref(50,:), x, h_ref(100,:))
plot(x, S(1,:), x, S(10,:),x , S(50,:), x, S(100,:))
integral_method
h_ref = 10-h
plot(x, S(1,:), x, S(10,:),x , S(50,:), x, S(100,:))
plot(x, h_ref(1,:), x, h_ref(10,:),x , h_ref(50,:), x, h_ref(100,:))
y = zeros([nt, nx])
y(1, :) = h_init
for i = 2:nx
slope = ([nt,nx])
slope = zeros([nt,nx])
slope(1,2:)
slope(1,2::)
slope(1,2:nx)
slope(1,2:nx) = (h(1,2:nx)-h(1,1:nx-1))./dx
slope(1, 1) = slope(1, 2)
y = receding_solver(slope, y, 1, dt, nt)
receding_solver
receding_solver(slope, y, 1, dt, nt)
y(1,1) + dt*slope(1, 1)
y = receding_solver(slope, y, v, dt, nt)
receding_method
length(h)
length(h(:,1))
length(h(1,:))
receding_method
cd 'C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB'
receding_method
plotter(h, x, t)
h
plot(x, h(1,:), x, h(2, :))
plot(x, h(2,:), x, h(3, :))
plot(x, h(2,:))
plot(x(1:5), h(2,1:5))
receding_method
plot(x(1:5), h(2,1:5))
plot(x, h(1,:), x, h(2, :))
plotter(h, x, t)
receding_method
plotter(h, x, t)
h_new = 10 - h
receding_method
h_new = 10 - h
plotter(h, x, t)
```

```
plotter(h_new, x, t)
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
plotter(h_new, x, t)
plot(x, h_new(1,:), x, h_new(2, :))
plot(x, h_new(1,:), x, h_new(10, :))
plot(x, h_new(5,:), x, h_new(10, :))
receding_method
plot(x, h_new(1,:), x, h_new(2, :))
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(10, :))
plot(x, h_new(1,:), x, h_new(100, :))
receding_method
plot(x, h_new(1,:), x, h_new(100, :))
receding_method
plot(x, h_new(1,:), x, h_new(100, :))
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(100, :))
receding_method
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(100, :))
receding_method
plot(x, h_new(1,:), x, h_new(100, :))
receding_method
plot(x, h_new(1,:), x, h_new(100, :))
receding_method
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(100, :))
receding_method
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(100, :))
plot(x, h_new(100, :))
receding_method
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(100, :))
plotter(S, x, t)
receding_method
h_new = 10 - h
plotter(S, x, t)
plot(x, h_new(1,:), x, h_new(100, :))
plot(x, h_new(1,:), x, h_new(2, :))
plot(x, h_new(1,:), x, h_new(3, :))
plotter(h_new, x, t)
plot(x, h_new(1,:), x, h_new(1000, :))
plot(x, h_new(1,:), x, h_new(100, :), x, h_new(500,:), x, h_new(1000, :))
plot(x, h_new(1,:), x, h_new(100, :), x, h_new(500,:), x, h_new(990, :))
plot(x, h_new(1,:), x, h_new(100, :), x, h_new(500,:), x, h_new(800, :))
```

```
plot(x, S(1000,:)
plot(x, S(1000,:))
receding_method
h_new = 10 - h
plot(x, S(1000,:))
plot(x, h_new(1,:), x, h_new(100, :), x, h_new(500,:), x, h_new(800, :))
receding_method
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(100, :), x, h_new(500,:), x, h_new(800, :))
receding_method
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(100, :), x, h_new(500,:), x, h_new(800, :))
plot(x, S(1,:)
plot(x, S(1,:))
plot(x, S(2,:))
receding_method
receding_method\
receding_method
H_pp
plot(x, H_pp(2,:))
receding_method
plot(x, H_pp(2,:))
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:), x, h_new(4, :))
plot(x, h_new(1,:), x, h_new(2, :))
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:))
receding_method
h_new = 10 - h\
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:))
receding_method
h_new = 10 - h\
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:))
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:), x, h_new(4, :))
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:), x, h_new(10, :))
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:), x, h_new(6, :))
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:), x, h_new(5, :))
receding_method
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:))
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:), x, h_new(5, :))
plotter(h_new, x, t)
receding_method
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:), x, h_new(5, :))
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:))
plot(x, h_new(1,:), x, h_new(2, :))
receding_method
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(2, :))
```

```
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:), x, h_new(5, :))
plot(x, h_new(1,:), x, h_new(2, :), x, h_new(3,:))
plot(x, h_new(3,:), x, h_new(4, :), x, h_new(5,:))
plot(x, h_new(3,:), x, h_new(4, :))
receding_method
h_new = 10 - h
plot(x, h_new(3,:), x, h_new(4, :))
plot(x, h_new(1,:), x, h_new(2, :))
receding_method
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(2, :))
plot(x, h_new(3,:), x, h_new(4, :))
plot(x, h_new(6,:), x, h_new(7, :))
plotter(h_new, x, t)
receding_method
h_new = 10 - h
plotter(h_new, x, t)
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
plotter(h_new, x, t)
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
plotter(h_new, x, t)
receding_method
plotter(h_new, x, t)
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
plotter(h_new, x, t)
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(1000,:))
plot(x, h_new(1,:),x, h_new(10,:),x, h_new(50,:))
plot(x, h_new(1,:),x, h_new(10,:),x, h_new(100,:))
plot(x, h_new(1,:),x, h_new(10,:),x, h_new(60,:))
plot(x, h_new(1,:),x, h_new(10,:),x, h_new(75,:))
plot(x, h_new(1,:),x, h_new(10,:),x, h_new(70,:))
plot(x, h_new(1,:),x, h_new(10,:),x, h_new(65,:))
plot(x, h_new(1,:),x, h_new(10,:),x, h_new(63,:))
plot(x, h_new(1,:),x, h_new(10,:),x, h_new(64,:))
receding_method
h_new = 10 - h
```

```
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(1000,:))
receding_method
h_new = 10 - h
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(1000,:))
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(800,:))
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(600,:))
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(520,:))
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(500,:))
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(550,:))
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(570,:))
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(580,:))
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(575,:))
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(572,:))
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(573,:))
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(574,:))
receding_method
h_new = 10 - h
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(574,:))
plotter(h_new, x, t)
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
plotter(h_new, x,t)
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(1000,:))
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
plotter(h_new, x, t)
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
receding_method
h_new = 10 - h
plotter(h_new, x, t)
plot(x, h_new(1,:),x, h_new(100,:),x, h_new(500,:),x, h_new(1000,:))
integral_method
plotter(h_new, x, t)
plotter(h, x, t)
integral_method
plotter(h, x, t)
h_plot = 10-h
plot(x, h(1,:),x, h(100,:),x, h(500,:),x, h(1000,:))
plot(x, h(1,:),x, h(10,:),x, h(50,:),x, h(100,:))
plot(x, h_plot(1,:),x, h_plot(10,:),x, h_plot(50,:),x, h_plot(100,:))
integral_method
plotter(h, x, t)
```

```
integral_method
plotter(h, x, t)
h_plot = 10 - h
plotter(h_plot, x, t)
integral_method
plotter(h, x, t)
receding_method
h_new = 10 - h
plotter(h_new, x, t)
receding_method
h_new = 10 - h
plotter(h_new, x, t)
receding_method
h_new = 10 - h
plotter(h_new, x, t)
receding_method
h_new = 10 - h
plotter(h_new, x, t)
plot(x, h_new(1000, :))
plot(x, h_new(600, :))
plot(x, h_new(800, :))
receding_method
integral_method
h_new = 10 - h
plot(x, h_new(800, :))
integral_method
h_new = 10 - h
plot(x, h_new(800, :))
integral_method
h_new = 10 - h
plot(x, h_new(800, :))
integral_method
plot(x, h_new(800, :))
h_new = 10 - h
plot(x, h_new(800, :))
integral_method
h_new = 10 - h
plot(x, h_new(800, :))
plotter(h_new, x, t)
integral_method
h_new = 10 - h
plotter(h_new, x, t)
integral_method
h_new = 10 - h
plotter(h_new, x, t)
integral_method
h_new = 10 - h
integral_method
plotter(h_new, x, t)
integral_method
h_new = 10 - h
```

```
plotter(h_new, x, t)
plotter(S, x, t)
integral_method
h_new = 10 - h
plotter(h_new, x, t)
integral_method
h_new = 10 - h
plotter(h_new, x, t)
plot(x, h(800, :))
plot(x, h_new(800, :))
plot(x, h_new(1,:), x, h_new(800, :))
integral_method
h_new = 10 - h
plot(x, h_new(1,:), x, h_new(800, :))
plotter(h_new, x, t)
integral_method
h_new = 10 - h
plotter(h_new, x, t)
integral_method
h_new = 10 - h
plotter(h_new, x, t)
plotter(S, x, t)
receding_method(h, nx dx, nt, dt, v)
receding_method(h, nx, dx, nt, dt, v)
h_new = 10 - h
plotter(h_new, x, t)
h = receding_method(h, nx, dx, nt, dt, v)
h_new = 10 - h
plotter(h_new, x, t)
x_new = x - 800*v
integral_method
h_new = 10 - h
h_new2 = receding_method(h,nx, dx, nt, dt, v)
h_new2 = 10 - h_new2
x_new = x - 800*v
plot(x, h_new(800,:), x_new,h_new2(800,:))
x_new = x + 1700*v
plot(x, h_new(800,:), x_new,h_new2(800,:))
x_new = x - 1700*v
plot(x, h_new(800,:), x_new,h_new2(800,:))
x_new = x + 1700*v
plot(x, h_new(800,:), x_new,h_new2(800,:))
plot(x, h_new(800,:), x ,h_new2(800,:))
integral_method
plotter(h2, x, t)
plotter(h - h2, x, t)
plot(x, h(800, :), x, h2(800, :))
plot (w, x, t)
plotter(w, x, t)
plot(x, w(800, :), x, h3(800,:))
plot(x, w(800, :), x, h2(800,:))
```

```
plot(x, w(800, :))
integral_method
plotter(h2, x, t)
plotter(h - h2, x, t)
plot(x, h(2,:) - h2(2, :))
plot(x, h(800,:) - h2(800, :))
integral_method
plotter(h,x,t)
S^2
S.^2
plotter(S^2, x, t)
plotter(S.^2, x, t)
integral_method
plotter(h,x,t)
h3 = receding_method(h, nx, dx, nt, dt, v)
plot(t, h(1, :), t, h2(1, :), t, h3(:, 1))
plot(t, h(:, 1), t, h2(:, 1), t, h3(:, 1))
plot(t, h(:, 800), t, h2(:, 800), t, h3(:, 800))
plot(t, h(:, 500), t, h2(:, 500), t, h3(:, 500))
plot(t, h(:, 1), t, h2(:, 1), t, h3(:, 1))
integral_method
h3 = receding_method(h, nx, dx, nt, dt, v)
plot(t, h(:, 1), t, h2(:, 1), t, h3(:, 1))
integral_method
h3 = receding_method(h, nx, dx, nt, dt, v)
plot(t, h(:, 1), t, h2(:, 1), t, h3(:, 1))
integral_method
h3 = receding_method(h, nx, dx, nt, dt, v^2/10000)
plot(t, h(:, 1), t, h2(:, 1), t, h3(:, 1))
h3 = receding_method(h, nx, dx, nt, dt, v^2/1000)
plot(t, h(:, 1), t, h2(:, 1), t, h3(:, 1))
h3 = receding_method(h, nx, dx, nt, dt, v^2)
plot(t, h(:, 1), t, h2(:, 1), t, h3(:, 1))
integral_method
average(Q)
max(Q)
integral_method
h3 = receding_method(h, nx, dx, nt, dt, v^2)
plot(t, h(:, 1), t, h2(:, 1), t, h3(:, 1))
h3 = receding_method(h, nx, dx, nt, dt, v^2/Q)
h3 = receding_method(h, nx, dx, nt, dt, v^2/Q(1,1))
plot(t, h(:, 1), t, h2(:, 1), t, h3(:, 1))
plot(t, h2(:, 1), t, h3(:, 1))
plot(t, h2(:, 50), t, h3(:, 50))
plot(t, h2(:, 500), t, h3(:, 500))
integral_method
plot(t, h2(:, 1), t, h3(:, 1))
plotter(h2, x, t)
plot(x, h2(1,:), x, h2(500, :))
integral_method
plotter(h2, x, t)
```

```
plotter(h, x, t)
integral_method
plotter(h, x, t)
plotter(u, x, t)
plot(t, u(:, 1))
plot(t, u(:, 2))
plot(t, u(:, 100))
plot(t, S(:, 100))
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(10-h, x, t)
plot(x, 10 - h(500, :), 10 - h(800, :))
plot(x, 10 - h(500, :), x, 10 - h(800, :))
integral_method
plot(x, 10 - h(500, :), x, 10 - h(800, :))
plotter(10-h, x, t)
integral_method
plotter(10-h, x, t)
integral_method
plotter(10-h, x, t)
integral_method
plotter(10-h, x, t)
plot(x, 10-h(500,:)
plot(x, 10-h(500,:))
integral_method
plot(x, 10-h(500,:))
plotter(h, x, t)
plot(x, h(1,:))
integral_method
plotter(h, x, t)
plot(x, 10-h(1,:), x, 10 - h(100, :))
integral_method
plotter(h, x, t)
plot(x, h(100, :))
plot(x, h(200, :))
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(500, :), x, h(800, :))
```

```
integral_method
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(500, :), x, h(800, :))
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = 10 - h\
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
plot(x, h2(1, :), x, h2(10,:))
plot(x, u(1, :), x, u(10,:))
plot(x, u(1, :), x, u(10,:), x , u(20,:))
min(u)
minimum(u)
max(u)
integral_method
plot(h, x, t)
plotter(h, x, t)
plotter(10-h, x, t)
integral_method
plotter(10-h, x, t)
integral_method
plotter(10-h, x, t)
integral_method
plotter(10-h, x, t)
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
```

```
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
plot(t, h2(:, 800))
plot(t, S(:, 800))
plot(t, u(:, 800))
integral_method
plot(t, u(:, 800))
plot(t, u(:, 500))
integral_method
plot(t, u(:, 500))
plot(t, S(:, 500))
integral_method
plot(t, S(:, 500))
integral_method
plot(t, S(:, 500))
integral_method
plot(x, u(800,:))
plot(x, u(700,:))
plot(x, u(500,:))
plot(x, u(100,:))
integral_method
plot(t, S(:, 500))
plot(t, S(:, 1000))
plot(t, h(:, 1000))
plot(t, 10- h(:, 1000))
plotter(10-h, x,t)
integral_method
plotter(10-h, x,t)
integral_method
plotter(10-h, x,t)
integral_method
plot(x, u(1,:))
plot(x, u(2,:))
plot(x, u(3,:))
integral_method
plot(x, u(3,:))
integral_method
plot(x, u(3,:))
plot(x, u(2,:))
integral_method
plot(x, u(3,:))
plot(x, u(2,:))
plot(x, u(3,:))
integral_method
plot(x, u(3,:))
integral_method
plot(x, u(100,:))
```

```
plot(x, u(1,:), x, u(100,:))
S = 1/sqrt(u.^10 - 1)
S = 1./sqrt(u.^10 - 1)
plot(x, S(1,:), x, S(100,:))
integral_method
plot(x, S(1,:), x, S(100,:))
plot(h, x, t)
plotter(h, x, t)
integral_method
plotter(h, x, t)
integral_method
plotter(h, x, t)
plotter(S, x, t)
plotter(u, x, t)
integral_method
plotter(h, x, t)
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
plot(x, h2(1, :), x, h2(10, :), x, h2(20, :))
plot(x, h2(1, :), x, h2(2, :), x, h2(3, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(2, :), x, h2(3, :))
plot(x, h2(1, :), x, h2(10, :), x, h2(20, :))
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
plot(x, h2(1, :), x, h2(2, :), x, h2(3, :))
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
h2 = 10 - h
integral_method
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
```

```
plot(x, w(1, :), x, w(100, :), x, w(200, :), x, w(500, :), x, w(800, :))
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
plot(x, h2(1, :), x, h2(2, :), x, h2(3, :))
integral_method
plot(x, h2(1, :), x, h2(2, :), x, h2(3, :))
h2 = 10 - h
plot(x, h2(1, :), x, h2(2, :), x, h2(3, :))
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
h2 = receding_method(h, nx, dx, nt, dt, v)
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
h2 = receding_method(h, nx, dx, nt, dt, v*10^9)
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
plot(x, h2(1, :), x, h2(2,:), x, h2(3,:))
h2 = receding_method(h, nx, dx, nt, dt, v*10^6)
plot(x, h2(1, :), x, h2(2,:), x, h2(3,:))
integral_method
plot(x, u(1, :), x, u(2,:), x, u(3,:))
integral_method
plot(x, u(1, :), x, u(100,:), x, u(500,:))
integral_method
h2 = 10 - h
plot(h2, x, t)
plot(x, h2(1, :), x, h2(2,:), x, h2(3,:))
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(500, :), x, h(800, :))
integral_method
plot(x, u(1, :), x, u(2,:), x, u(3,:))
plot(x, u(1, :), x, u(100,:), x, u(200,:))
plotter(u, x, t)
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
integral_method\
integral_method
h2 = 10 - h
plot(x, h2(1, :), x, h2(100, :), x, h2(200, :), x, h2(500, :), x, h2(800, :))
integral_method
integral_method
integral_method
h2 = 10 - h
plot(h2, x, t)
plotter(h2, x, t)
plot(x, h2(1, :), x, h2(200, :), x, h2(1000, :), x, h2(5000, :), x, h2(10000, :))
plot(x, h2(1, :), x, h2(200, :), x, h2(1000, :))
plot(x, h2(1, :), x, h2(1000, :), x, h2(2000, :))
plot(x, h2(1, :), x, h2(1000, :), x, h2(3000, :))
integral_method
```

```
plot(x, u(1, :), x, u(50,:), x, u(100,:))
integral_method
plot(x, u(1, :), x, u(50,:), x, u(100,:))
integral_method
plot(x, u(1, :), x, u(50,:), x, u(139,:))
integral_method
plot(x, u(1, :), x, u(50,:), x, u(138,:))
plotter(u, x, t)
integral_method
plot(x, u(1, :), x, u(50,:), x, u(150,:))
integral_method
%-- 2023-06-28 9:26 AM --%
integral_method
addpath 'C:\Users\maggi\Documents\School↵
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\HelperFunctions'
integral_method
plot(x, S(1, :) - S(100, :))
integral_method
plotter(S, x, t)
plot(x, S(2,:))
plotter(h2, x, t)
integral_method
plotter(h(1:141, :), x, t(1:141))
plotter(h2(1:141, :), x, t(1:141))
plot(x, h(2,:))
plot(x, h(3,:))
plot(x, h2(2,:))
integral_method
plot(x, h2(2,:))
plot(x, h2(140,:))
plot(x, h2(130,:))
integral_method
plot(x, u(130,:))
integral_method
plot(x, h2(140,:))
plotter(h2, x, t)
plot(x, 10-h2(1,:))
integral_method
plot(x, 10-h2(1,:))
plotter(h2, x, t)
h_new = 10 - h2
plot(x, h_new(1,:), x, h_new(100, :))
plot(x, h_new(1,:), x, h_new(50, :))
plot(x, h_new(1,:), x, h_new(5, :))
plot(x, h_new(1,:), x, h_new(3, :))
plot(x, h_new(1,:), x, h_new(2, :))
plot(x, S(:, 1), x, S(:, 2))
plot(x, S(1,:), x, S(2,:))
integral_method
plot(x, S(1,:), x, S(2,:))
integral_method
```

```
plot(x, h_new(1,:), x, h_new(100, :))
plotter(u, x, t)
plotter(h, x, t)
integral_method
plotter(u, x, t)
plotter(h(1,:) - h, x, t)
integral_method
plotter(h(1,:) - h, x, t)
plot(x, h(1,:), x, h(170, :))
integral_method
plotter(h(1,:) - h, x, t)
plot(x, h(1,:), x, h(170, :))
plot(x, 10 - h(1,:), x, 10 - h(1700, :))
integral_method
plotter(h(1,:) - h, x, t)
plot(x, 10 - h(1,:), x, 10 - h(1700, :))
plot(x, 10 - h(1,:), x, 10 - h(170, :))
integral_method
plotter(h(1,:) - h, x, t)
plot(x, 10 - h(1,:), x, 10 - h(1700, :))
integral_method
plotter(u, x, t)
integral_method
plotter(h(1,:) - h, x, t)
integral_method
plotter(u, x, t)
integral_method
plotter(u, x, t)
integral_method
plot(u, x, t)
plotter(u, x, t)
plotter(u(1, :) - u, x, t)
integral_method
plotter(u(1, :) - u, x, t)
plot(x, h(1,:), x, h(1700,:))
plot(x, 10- h(1,:), x, 10 - h(1700,:))
plotter(S(1, :) - S, x, t)
plotter(u(1, :) - u, x, t)
plot(x, u(1,:), x, u(1700,:))
S = 1./(sqrt(u.^(10)-1));
plot(x, u(1,:), x, S(1700,:))
plot(x, S(1,:), x, S(1700,:))
plot(x, S(1,:), x, S(100, :), x, S(1000, :), x, S(1700,:))
integral_method
plot(x, S(1,:), x, S(100, :), x, S(1000, :), x, S(1700,:))
plot(x, S(1,:), x, S(10, :), x, S(100, :), x, S(170,:))
integral_method
plot(x, S(1,:), x, S(10, :), x, S(100, :), x, S(170,:))
plot(x, 10- h(1,:), x, 10 - h(170,:))
integral_method
plot(x, 10- h(1,:), x, 10 - h(170,:))
```

```matlab
integral_method
plot(x, 10- h(1,:), x, 10 - h(170,:))
integral_method
plot(x, 10- h(1,:), x, 10 - h(170,:))
plot(x, S(1,:)-S(170,:))
integral_method
plot(x, S(1,:)-S(170,:))
integral_method
plot(x, S(1,:)-S(170,:))
integral_method
plot(x, S(1,:)-S(170,:))
integral_method
plot(x, S(1,:)-S(170,:))
integral_method
plot(x, S(1,:)-S(170,:))
integral_method
plot(x, S(1,:)-S(170,:))
for j = 2:nt
ut(j,:) = (u(j,:) - u(j-1, :))/dt
end
integral_method
for j = 2:nt
ut(j,:) = (u(j,:) - u(j-1, :))/dt
end
integral_method
for j = 2:nt
ut(j,:) = (u(j,:) - u(j-1, :))/dt
end
integral_method
iterthresh
integral_method
u_new - uj(1,:)
integral_method
u_new - uj(1,:)
max(unew2-u_new)
abs(max(unew2-u_new))
max(unew2-u_new)
u_new - uj(1,:)
integral_method
iterthresh
integral_method
for j = 2:nt
ut(j,:) = (u(j,:) - u(j-1, :))/dt
end
integral_method
plotter(u,x,t)
integral_method
plotter(u,x,t)
plotter(real(u),x,t)
integral_method
plotter(u,x,t)
```

```
plotter(real(u),x,t)
plotter(u(1:30,:)),x,t(1:30))
plotter(u(1:30,:),x,t(1:30))
plotter(u(1,1:30),x(1:20),t)
plotter(u,x,t)
plotter(real(u(1,1:30)),x(1:20),t)
plotter(real(u(:,1:30)),x(1:30),t)
integral_method
plotter(abs(u), x, t)
plotter(real(u), x, t)
plotter(h, x, t)
plotter(10-h, x, t)
plot(x, 10-h(1,:), x, 10-h(10, :))
integral_method
plot(x, h)
integral_method
plotter(h, x, t)
plotter(real(h), x, t)
plot(x, h(1,:), x, h(100, :))
integral_method
plot(x, h(2,:))
integral_method\
integral_method
plot(x, h(2,:))
plot(x, h(1, :), x, h(2, :))
integral_method
plot(x, h(2,:))
plot(x, 10 - h(2,:))
integral_method
plot(x, h(1, :), x, h(2, :))
plot(x, h(1, :)- h(2, :))
integral_method
plot(x, h(3,:))
integral_method
plot(x, h(3,:))
integral_method
plot(x, h(1, :), x, h(2, :))
plot(x, h(3,:))
plot(x, u(1, :), x, u(2, :))
integral_method
plot(x, u(1, :), x, u(2, :))
plotter(u, x, t)
integral_method
plotter(u, x, t)
plotter(h, x, t)
plotter(10-h, x, t)
plot(x, 10- h(100,:))
plot(x, 10-h(1,:), x, 10- h(100,:))
integral_method
plot(x, 10-h(1,:), x, 10- h(100,:))
integral_method
```

```
plot(x, 10-h(1,:), x, 10- h(100,:))
plot(x, 10-h(1,:), x, 10- h(1000,:))
plot(x, 10-h(1,:), x, 10- h(100,:), x, 10- h(300,:), x, 10- h(500,:))
plot(x, 10-h(1,:), x, 10- h(100,:), x, 10- h(150,:), x, 10- h(200,:))
plot(x, 10-h(1,:), x, 10- h(100,:), x, 10- h(150,:), x, 10- h(190,:))
integral_method
plot(x, 10-h(1,:), x, 10- h(100,:))
plot(x, 10-h(1,:), x, 10- h(1000,:))
integral_method
plot(x, 10-h(1,:), x, 10- h(1000,:))
integral_method
plot(x, 10-h(1,:), x, 10- h(1000,:))
integral_method
plot(x, 10-h(1,:), x, 10- h(1000,:))
integral_method
plot(x, 10-h(1,:), x, 10- h(1000,:))
integral_method
plot(x, 10-h(1,:), x, 10- h(1000,:))
integral_method
plot(x, 10-h(1,:), x, 10- h(1000,:))
integral_method
plot(x, 10-h(1,:), x, 10- h(1000,:))
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
plot(x, u(1,:), x, u(1000,:))
plot(x, u(1,:), x, u(100,:))
integral_method
plot(x, u(1,:), x, u(100,:))
plot(x, u(1,:), x, u(10,:))
plot(x, u(1,:), x, u(2,:))
integral_method
plot(x, u(1,:), x, u(2,:))
integral_method
plot(x, u(1,:), x, u(2,:))
plot(x, u(1,:), x, u(100,:))
integral_method
plot(x, u(1,:), x, u(100,:))
plot(x, u(1,:), x, u(10,:))
integral_method
plot(x, u(1,:), x, u(10,:))
plot(x, u(1,:), x, u(100,:))
plot(x, u(1,:), x, u(20,:))
plot(x, u(1,:), x, u(15,:))
plot(x, u(1,:), x, u(12,:))
plot(x, u(1,:), x, u(10,:))
plot(x, u(1,:), x, u(9,:))
integral_method
plot(x, u(1,:), x, u(9,:))
```

```
plot(x, u(1,:), x, u(100,:))
plot(x, u(1,:), x, u(1000,:))
plot(x, h(1,:), x, h(1000,:))
plot(x, 10-h(1,:), x, 10 - h(1000,:))
plot(x, S(1,:), x, S(1000,:))
plot(x, w(1,:), x, w(1000,:))
integral_method
plot(x, h(1,:), x, h(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
integral_method
plot(x, S(1,:), x, S(1000,:))
plot(x, S(1,:), x, S(10,:))
plot(x, S(1,:), x, S(1,:))
plot(x, S(1,:), x, S(2,:))
integral_method
plot(x, S(1,:), x, S(2,:))
plot(x, S(1,:), x, S(3,:))
plot(x, S(1,:), x, S(10,:))
integral_method
plot(x, S(1,:), x, S(2,:))
integral_method
plot(x, S(1,:), x, S(2,:))
plot(x, S(1,:), x, S(3,:))
plot(x, S(1,:), x, S(10,:))
plot(x, S(1,:), x, S(100,:))
plot(x, S(1,:), x, S(50,:))
plot(x, S(1,:), x, S(40,:))
plot(x, S(1,:), x, S(30,:))
```

```
plot(x, h(1, :), x, h(10, :), x, h(30,:))
plot(x, 10 - h(1, :), x, 10 - h(10, :), x, 10 - h(30,:))
plot(x, S(1,:), x, S(30,:))
plot(x, h(10, :))
plot(x, h(30, :))
plot(x, h(50, :))
plot(x, h(40, :))
integral_method
plot(x, h(40, :))
plot(x, 10 - h(1, :), x, 10 - h(10, :), x, 10 - h(30,:))
plot(x, 10 - h(1, :), x, 10 - h(10, :), x, 10 - h(39,:))
plot(x, 10 - h(1, :), x, 10 - h(10, :), x, 10 - h(45,:))
plot(x, 10 - h(1, :), x, 10 - h(10, :), x, 10 - h(100,:))
integral_method
plot(x, 10 - h(1, :), x, 10 - h(10, :), x, 10 - h(30,:))
plotter(real(S), x, t)
integral_method
plotter(real(S), x, t)
plot(S, x, t)
plot(x, S(1,:), x, S(2, :))
plot(x, S(1,:), x, S(3, :))
plot(x, S(1,:), x, S(4, :))
plot(x, S(1,:), x, S(5, :))
plot(x, S(1,:), x, S(6, :))
plot(x, S(1,:), x, S(7, :))
plot(x, S(1,:), x, S(15, :))
plot(x, S(1,:), x, S(30, :))
plot(x, S(1,:), x, S(68, :))
plot(x, S(1,:), x, S(82, :))
plot(x, S(1,:), x, S(128, :))
plot(x, S(1,:), x, S(129, :))
plot(x, S(1,:), x, S(696, :))
max(S(:, 98))
integral_method
plot(x, S(1,:), x, S(5, :))
plotter(S, x, t)
plot(x, S(1, :), x, S(10, :))
plot(x, S(1, :), x, S(100, :))
plotter(10 - h, x, t)
integral_method
plot(x, S(1, :), x, S(100, :))
plotter(real(S), x, t)
plot(x, S(2,:), x, S(3,:))
plot(x, S(5,:), x, S(6,:))
plotter(real(h), x, t)
plot(x, h(1, :), x, h(5, :), x, h(9, :), x, h(10, :))
plot(x, h(10, :), x, h(50, :), x, h(90, :), x, h(100, :))
integral_method
plot(x, h(10, :), x, h(50, :), x, h(90, :), x, h(100, :))
plot(x, h(100, :), x, h(500, :), x, h(900, :), x, h(1000, :))
h_new = 10 - h
```

```
plot(x, h_new(1, :), x, h_new(100, :), x, h_new(500, :), x, h_new(1000, :))
integral_method
plot(x, h_new(1, :), x, h_new(100, :), x, h_new(500, :), x, h_new(1000, :))
plot(x, h(100, :), x, h(500, :), x, h(900, :), x, h(1000, :))
integral_method
h_new = 10 - h;
plot(x, h_new(1, :), x, h_new(100, :), x, h_new(500, :), x, h_new(1000, :))
integral_method
h_new = 10 - h;
plot(x, h_new(1, :), x, h_new(100, :), x, h_new(500, :), x, h_new(1000, :))
integral_method
%-- 2023-06-29 9:38 AM --%
incising_explicit
addpath 'C:\Users\maggi\Documents\School↙
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\HelperFunctions'
incising_explicit
plotter(h, x, t)
plotter(h-h(1,:), x,t)
incising_explicit
plotter(h-h(1,:), x,t)
plot(x, h(1,:), x, h(100, :), x, h(500,:))
incising_explicit
plot(x, h(1,:), x, h(100, :), x, h(500,:))
incising_explicit
plot(x, h(1,:), x, h(100, :), x, h(500,:))
incising_explicit
plot(x, h(1,:), x, h(100, :), x, h(500,:))
incising_explicit
plot(x, h(1,:), x, h(100, :), x, h(500,:))
plot(x, h(1,:), x, h(100, :))
plot(x, S(1,:), x, S(100, :))
incising_explicit
plot(x, S(1,:), x, S(100, :))
incising_explicit
plot(x, S(1,:), x, S(100, :))
plot(x, S(1,:), x, S(10, :))
incising_explicit
plot(x, S(1,:), x, S(10, :))
incising_explicit
plot(x, S(1,:), x, S(10, :))
plot(x, h(1,:), x, h(100, :), x, h(500,:))
plot(x, h(1,:), x, h(10000, :), x, h(17000,:))
incising_explicit
plot(x, h(1,:), x, h(10000, :), x, h(17000,:))
incising_explicit
plot(x, h(1,:), x, h(10000, :), x, h(17000,:))
incising_explicit
plot(x, h(1,:), x, h(10000, :), x, h(17000,:))
incising_explicit
plot(x, h(1,:), x, h(10000, :), x, h(17000,:))
incising_explicit
```

```
plot(x, h(1,:), x, h(10000, :), x, h(17000,:))
incising_explicit
plot(x, h(1,:), x, h(10000, :), x, h(17000,:))
incising_explicit
plot(x, h(1,:), x, h(10000, :), x, h(17000,:))
incising_explicit
plot(x, h(1,:), x, h(10000, :), x, h(17000,:))
h_diff = 10 - (h-h(1,:))
plot(x, h_diff(1,:), x, h_diff(10000, :), x, h_diff(17000,:))
h_diff = h_diff - 10
plot(x, h_diff(1,:), x, h_diff(10000, :), x, h_diff(17000,:))
h_diff = h_diff - 10
incising_explicit
h_diff = h_diff - 10
h_diff = 10 - (h-h(1,:))
h_diff =(h-h(1,:))
plot(x, h_diff(1,:), x, h_diff(10000, :), x, h_diff(17000,:))
incising_explicit
plot(x, h_diff(1,:), x, h_diff(10000, :), x, h_diff(17000,:))
incising_explicit
h_diff =(h-h(1,:))
plot(x, h_diff(1,:), x, h_diff(10000, :), x, h_diff(17000,:))
h_diff =(h-h(1,:))
incising_explicit
h_diff =(h-h(1,:))
plot(x, h_diff(1,:), x, h_diff(10000, :), x, h_diff(17000,:))
plotter(S, x, t)
incising_explicit
plotter(S, x, t)
incising_explicit
plotter(S, x, t)
incising_explicit
plotter(S, x, t)
plotter(S-S(1,:), x, t)
h_diff = h-h(1,:)
plot(x, h_diff(1,:), x, h_diff(10000, :), x, h_diff(17000,:))
plot(x, h_diff(1,:), x, h_diff(10000, :), x, h_diff(15000,:))
plot(x, h_diff(1,:), x, h_diff(5000, :), x, h_diff(1000,:))
plot(t, h_diff(:, 1))
plot(t(2:nt), h_diff(2:nt, 1))
incising_explicit
h_diff = h-h(1,:)
plot(t(2:nt), h_diff(2:nt, 1))
plot(t(2:nt), h_diff(2:nt, 2))
plot(t(2:nt), h_diff(2:nt, 10000))
plot(t(2:nt), h_diff(2:nt, 1000))
plot(t(2:nt), h_diff(2:nt, 10))
plot(10 - h(15000,:))
plot(x,10 - h(15000,:))
plot(x, 10 - h(1,:), x,10 - h(15000,:))
incising_explicit
```

```
plot(x, 10 - h(1,:), x,10 - h(15000,:))
plot(t, h - h(1,:))
plot(t, h(:, 80) - h(1,:))
h_diff = h - h(1,:)
plot(t, h_diff(:, 100))
plotter(h_diff, x, t)
incising_explicit
h_diff = h - h(1,:)
plotter(h_diff, x, t)
plot(x, S(:, 17000))
plot(x, S(17000, :))
plot(x, S(170, :))
plot(x, S(1700, :))
plot(x, S(17000, :))
plot(x, S(17, :))
plot(t, S(:, 100))
plot(t, S(:, 10))
plot(t, S(:, 100))
incising_explicit
plot(t, S(:, 100))
plot(x, h(1,:), x, h(17000, :))
d_diff = h - h(1,:)
plot(x, h_diff(2, :), x, h_diff (17000, :))
incising_explicit
d_diff = h - h(1,:)
plot(x, h_diff(2, :), x, h_diff (17000, :))
plot(x, h(1,:), x, h(17000, :))
incising_explicit
plot(x, h(1,:), x, h(17000, :))
h_diff = h - h(1,:)
plot(x, h_diff(17000,:))
incising_explicit
h_diff = h - h(1,:)
plot(x, h_diff(17000,:))
incising_explicit
h_diff = h - h(1,:)
plot(x, h_diff(17000,:))
plot(x, h(1,:), x, h(17000, :))
incising_explicit
plot(x, h(1,:), x, h(17000, :))
incising_explicit
plot(x, h(1,:), x, h(17000, :))
incising_explicit
plot(x, h(1,:), x, h(17000, :))
incising_explicit
plot(x, h(1,:), x, h(17000, :))
incising_explicit
plot(x, h(1,:), x, h(17000, :))
incising_explicit
plot(x, h(1,:), x, h(17000, :))
incising_explicit
```

```
plot(x, h(1,:), x, h(17000, :))
incising_explicit
plot(x, h(1,:), x, h(17000, :))
incising_explicit
plot(x, h(1,:), x, h(17000, :))
h_diff = h - h(1,:)
plot(x, h_diff(17000,:))
incising_explicit
plot(x, h_diff(17000,:))
h_diff = h - h(1,:)
plot(x, h_diff(17000,:))
plot(x, 10 -h(17000,:))
incising_explicit
h_diff = h - h(1,:)
plot(x, h_diff(17000,:))
incising_explicit
h_diff = h - h(1,:)
plot(x, h_diff(17000,:))
plot(x, h_diff(170,:))
plot(x, 10 -h(17000,:))
plot(x, 10 -h(1700,:))
plot(x, 10 - h(1, :), x, 10 -h(1700,:))
h_diff = h(1,:) - h
plot(x, h_diff(170,:))
incising_explicit
h_diff = h(1,:) - h
plot(x, h_diff(170,:))
plotter(h, x, t)
incising_explicit
plotter(h, x, t)
h_diff = h - h(1,:)
plot(x, h_diff(170,:))
plot(x, h_diff(17000,:))
incising_explicit
plot(x, h_diff(17000,:))
plot(x, h(1,:), x, h(17000,:))
incising_explicit
h_diff = h - h(1,:)
plot(x, h_diff(17000,:))
incising_explicit
plot(x, h_diff(17000,:))
h_diff = h - h(1,:)
plot(x, h_diff(17000,:))
incising_explicit
h_diff = h - h(1,:)
plot(x, h_diff(17000,:))
plot(x, h_diff(170,:))
plotter(h, x, t)
incising_explicit
h_diff = h - h(1,:)
plot(x, h_diff(17000,:))
```

```matlab
plot(x, S(17000, :))
incising_explicit
h_diff = h - h(1,:)
plot(x, S(17000, :))
plot(x, h_diff(17000,:))
plot(x, h_diff(1700,:))
plot(x, h_diff(10,:))
plotter(h, x, t)
incising_explicit
h_diff = h - h(1,:);
plot(x, h_diff(1700,:))
plot(x, h_diff(17,:))
incising_explicit
h_diff = h - h(1,:);
plotter(h_diff, x, t)
plotter(S, x, t)
dS = S - S(1,:)
plotter(dS,x,t)
incising_explicit
h_diff = h - h(1,:);
plotter(h_diff, x, t)
dS = S - S(1,:)
plotter(dS,x,t)
plot(x, dS(17000,:))
incising_explicit
h_diff = h - h(1,:);
dS = S - S(1,:);
plot(x, dS(17000,:))
plot(x, dS(170,:))
plot(x, dS(17,:))
plotter(h_diff, x, t)
for j = 2:nt
St(j) = (S(j,:) - S(j-1,:))/dt;
end
St(j) = (S(j,:) - S(j-1,:))./dt;
St = zeros([nt]);
for j = 2:nt
St(j) = (S(j,:) - S(j-1,:))./dt;
end
for j = 2:nt
St(j,:) = (S(j,:) - S(j-1,:))./dt;
end
St = zeros([nt,nx]);
for j = 2:nt
St(j,:) = (S(j,:) - S(j-1,:))./dt;
end
plotter(St, x, t)
incising_explicit
h_diff = h - h(1,:);
plotter(h_diff, x, t)
plot(x, h(1,:), x, h(17000, :))
```

```matlab
%-- 2023-06-30 9:28 AM --%
incising_explicit
addpath 'C:\Users\maggi\Documents\School↵
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\HelperFunctions'
incising_explicit
plot(x, h(1,:), x, h(17000, :))
plot(x, S(1,:), x, S(17000, :))
S_diff = S - S(1,:)
plotter(S_diff, x, t)
plot(t, S_diff(:, 4))
plot(t, S_diff(:, 2))
plot(t, S_diff(:, 7))
plot(t, S_diff(:, 20))
plot(t, S_diff(:, 19))
for j = 2:nt
dS(j,:) = (S(j, :) - S(j-1,:))/dt;
end
plotter(dS, x, t)
for i = 2:nx
Sx(:, i) = (S(:, i)-S(:,i-1))/dx;
end
plotter(Sx, x, t)
plot(t, Sx(:, 2))
incising_explicit
for i = 2:nx
Sx(:, i) = (S(:, i)-S(:,i-1))/dx;
end
plot(t, Sx(:, 2))
plot(t, Sx(:, 4))
plot(t, Sx(:, 20))
plot(t, Sx(:, 19))
plot(t, Sx(:, 5))
plotter(Sx, x, t)
incising_explicit
for i = 2:nx
Sx(:, i) = (S(:, i)-S(:,i-1))/dx;
end
plot(t, Sx(:, 4))
plot(t, Sx(:, 5))
plot(t, Sx(:, 19))
plot(t, Sx(:, 20))
plot(t, Sx(:, 21))
plot(t, Sx(:, 19),t, Sx(:, 20),t, Sx(:, 21))
plot(t, Sx(:, 18), t, Sx(:, 19),t, Sx(:, 20),t, Sx(:, 21), t, Sx(:, 22))
plot(t, Sx(:, 18), t, Sx(:, 19),t, Sx(:, 20),t, Sx(:, 21), t, Sx(:, 23))
plot(t, Sx(:, 18), t, Sx(:, 19),t, Sx(:, 20),t, Sx(:, 21), t, Sx(:, 25))
plot(t, Sx(:, 20), t, Sx(:, 25),t, Sx(:, 30),t, Sx(:, 35), t, Sx(:, 40))
plot(t, Sx(:, 28), t, Sx(:, 30),t, Sx(:, 32),t, Sx(:, 34), t, Sx(:, 36))
plot(x,h(17000,:))
plot(x, h(1,:), x,h(17000,:))
plot(x(20:40), h(1,20:40), x,h(17000,20:40))
```

```
plot(x(20:40), h(1,20:40), x(20:40),h(17000,20:40))
h_diff = h - h(1,:)
plot(x(20:40), h(17000, 20:40))
plot(x(20:40), h_diff(17000, 20:40))
plot(x(20:40), h_diff(1700, 20:40),x(20:40), h_diff(17000, 20:40))
incising_explicit
plot(x, h(1,:), x,h(17000,:))
h_diff = h - h(1,:)
plot(x(20:40), h_diff(1700, 20:40),x(20:40), h_diff(17000, 20:40))
incising_explicit
plot(x(2:20), h(1, 2:20), x(2:20), h(17000, 2:20))
plot(x, S(17000,:))
incising_explicit
plot(x, S(17000,:))
incising_explicit
plot(x, S(17000,:))
plot(x, S(1000:))
plot(x, S(1000,:))
incising_explicit
plot(x, S(1000,:))
incising_explicit
plot(x, S(1000,:))
plot(x, S(100,:))
incising_explicit
plot(x, S(100,:))
plot(x, S(10,:),x, S(1000,:))
S(10,:) - S(1000, :)
plot(x,S(10,:) - S(1000, :))
plot(x(20:50),S(10,20:50) - S(1000, 20:50))
plot(x(20:50),S(1000,20:50) - S(10, 20:50))
plot(x(20:50),h(1000,20:50) - h(10, 20:50))
plot(x(20:50),S(1000,20:50) - S(10, 20:50))
plot(x(1:50),S(1000,1:50) - S(10, 1:50))
plot(x(10:50),S(1000,10:50) - S(10, 10:50))
plot(x(10:40),S(1000,10:40) - S(10, 10:40))
incising_explicit
plot(x(10:40),S(1000,10:40) - S(10, 10:40))
plot(x(10:50),S(1000,10:50) - S(10, 10:50))
plot(x(10:50),S(1000,10:50) - S(990, 10:50))
incising_explicit
plot(x(10:50),S(1000,10:50) - S(990, 10:50))
incising_explicit
plot(x, h(1, :))
plot(x, h(2, :))
plot(x, h(1, :), x, h(2, :))
incising_explicit
plot(x, h(1, :), x, h(2, :))
incising_explicit
plot(x(1:50),S(1000,1:50) - S(10, 1:50))
incising_explicit
plot(x(1:50),S(1000,1:50))
```

```
plot(x(1:50),S(1700,1:50))
incising_explicit
plotter(real(h), x, t)
incising_explicit
plotter(real(h), x, t)
plot(x, h(1, :), x h(1700, :))
plot(x, h(1, :), x, h(1700, :))
incising_explicit
abs(1+i)
abs(1-i)
abs(1+sqrt(-1))
incising_explicit
plotter(h, x, t)
h_new = h - h(1,:)
plotter(h_new,x, t)
plot(x, h(1, :), x, h(100, :))
plot(x, h(1, :), x, h(10, :), x, h(100, :))
plot(x, h(1, :), x, h(2, :), x, h(100, :))
h_new = h - h(1,:)
incising_explicit
plot(x, h(1, :), x, h(2, :), x, h(100, :))
plot(x, h(1, :), x, h(2, :))
incising_explicit
plot(x, h(1, :), x, h(2, :))
incising_explicit
plot(x, h(1, :), x, h(2, :), x, h(100, :))
incising_explicit
plot(x, h(1, :), x, h(1000, :), x, h(1700, :))
plot(x, S(1, :), x, S(1000, :), x, S(1700, :))
plot(x, S(1, :), x, S(500,:), x, S(1000, :), x, S(1700, :))
plot(x(2:nx), S(1, 2:nx), x(2:nx), S(500,2:nx), x(2:nx), S(1000, 2:nx), x(2:nx), S ↵
(1700, 2:nx))
incising_explicit
plot(x(2:nx), S(1, 2:nx), x(2:nx), S(500,2:nx), x(2:nx), S(1000, 2:nx), x(2:nx), S ↵
(1700, 2:nx))
incising_explicit
plot(x(2:nx), Sx(1, 2:nx), x(2:nx), Sx(500,2:nx), x(2:nx), Sx(1000, 2:nx), x(2:nx), Sx ↵
(1700, 2:nx))
incising_explicit
plot(x(2:nx), Sx(1, 2:nx), x(2:nx), Sx(500,2:nx), x(2:nx), Sx(1000, 2:nx), x(2:nx), Sx ↵
(1700, 2:nx))
plot(t, St(:, 2), t, St(:, 1700))
plot(t, St(:, 2), t, St(:, 100))
plot(t(2:nt), St(2:nt, 2), t(2:nt), St(2:nt, 100))
incising_explicit
plot(t(2:nt), St(2:nt, 2), t(2:nt), St(2:nt, 100))
incising_explicit
plot(t(2:nt), St(2:nt, 2), t(2:nt), St(2:nt, 100))
plot(t(2:nt), St(2:nt, 2), t(2:nt), St(2:nt, 50),t(2:nt), St(2:nt, 100) )
incising_explicit
plot(t(2:nt), St(2:nt, 2), t(2:nt), St(2:nt, 50),t(2:nt), St(2:nt, 100) )
```

```
plot(t(2:nt), St(2:nt, 2), t(2:nt), St(2:nt, 100))
incising_explicit
plot(t(2:nt), St(2:nt, 2), t(2:nt), St(2:nt, 100))
plot(x(2:nx), Sx(1, 2:nx), x(2:nx), Sx(100,2:nx))
plot(x(5:nx), Sx(1, 5:nx), x(5:nx), Sx(100,5:nx))
plot(x(5:nx), Sx(1, 5:nx), x(5:nx), Sx(50,5:nx), x(5:nx), Sx(100,5:nx))
plot(x(5:nx), Sx(1, 5:nx), x(5:nx), Sx(10,5:nx),x(5:nx), Sx(50,5:nx), x(5:nx), Sx ↙
(70,5:nx), x(5:nx), Sx(100,5:nx))
incising_explicit
plot(x(5:nx), Sx(1, 5:nx), x(5:nx), Sx(10,5:nx),x(5:nx), Sx(50,5:nx), x(5:nx), Sx ↙
(70,5:nx), x(5:nx), Sx(100,5:nx))
plot(x(5:nx), h(1, 5:nx), x(5:nx), h(10,5:nx),x(5:nx), h(50,5:nx), x(5:nx), h(70,5: ↙
nx), x(5:nx), h(100,5:nx))
plot(x(5:nx), S(1, 5:nx), x(5:nx), S(10,5:nx),x(5:nx), S(50,5:nx), x(5:nx), S(70,5: ↙
nx), x(5:nx), S(100,5:nx))
h_diff = h - h(1,:)
plot(x(5:nx), h_diff(1, 5:nx), x(5:nx), h_diff(10,5:nx),x(5:nx), h_diff(50,5:nx), x(5: ↙
nx), h_diff(70,5:nx), x(5:nx), h_diff(100,5:nx))
incising_explicit
h_diff = h - h(1,:);
plot(x(5:nx), h_diff(1, 5:nx), x(5:nx), h_diff(10,5:nx),x(5:nx), h_diff(50,5:nx), x(5: ↙
nx), h_diff(70,5:nx), x(5:nx), h_diff(100,5:nx))
plot(x(5:nx), h_diff(1, 5:nx), x(5:nx), h_diff(100,5:nx),x(5:nx), h_diff(500,5:nx), x ↙
(5:nx), h_diff(1000,5:nx), x(5:nx), h_diff(1700,5:nx))
incising_explicit
h_diff = h - h(1,:);
plot(x(5:nx), h_diff(1, 5:nx), x(5:nx), h_diff(100,5:nx),x(5:nx), h_diff(500,5:nx), x ↙
(5:nx), h_diff(1000,5:nx), x(5:nx), h_diff(1700,5:nx))
incising_explicit
h_diff = h - h(1,:);
plot(x(5:nx), h_diff(1, 5:nx), x(5:nx), h_diff(100,5:nx),x(5:nx), h_diff(500,5:nx), x ↙
(5:nx), h_diff(1000,5:nx), x(5:nx), h_diff(1700,5:nx))
incising_explicit
h_diff = h - h(1,:);
plot(x(5:nx), h_diff(1, 5:nx), x(5:nx), h_diff(100,5:nx),x(5:nx), h_diff(500,5:nx), x ↙
(5:nx), h_diff(1000,5:nx), x(5:nx), h_diff(1700,5:nx))
incising_explicit
h_diff = h - h(1,:);
plot(x(5:nx), h_diff(1, 5:nx), x(5:nx), h_diff(100,5:nx),x(5:nx), h_diff(500,5:nx), x ↙
(5:nx), h_diff(1000,5:nx), x(5:nx), h_diff(1700,5:nx))
incising_explicit
h_diff = h - h(1,:);
plot(x(5:nx), h_diff(1, 5:nx), x(5:nx), h_diff(100,5:nx),x(5:nx), h_diff(500,5:nx), x ↙
(5:nx), h_diff(1000,5:nx), x(5:nx), h_diff(1700,5:nx))
%-- 2023-07-03 9:39 AM --%
incising_explicit
addpath 'C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB'
incising_explicit
addpath 'C:\Users\maggi\Documents\School ↙
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\HelperFunctions'
incising_explicit
```

```
h_diff = h - h(1,:);
plot(x(5:nx), h_diff(1, 5:nx), x(5:nx), h_diff(100,5:nx),x(5:nx), h_diff(500,5:nx), x ↵
(5:nx), h_diff(1000,5:nx), x(5:nx), h_diff(1700,5:nx))
Sx_plot = linspace(0.0001, 10, 10000);
S_plot = linspace(0.001, 10, 1000);
St_plot = 6/5.*Sx_plot.*(S_plot.^(1/5)./(1+S_plot.^2).^(8/5));
S_plot = linspace(0.0001, 10, 10000);
St_plot = 6/5.*Sx_plot.*(S_plot.^(1/5)./(1+S_plot.^2).^(8/5));
plotter(St_plot, S_plot, Sx_plot);
St_plot = 6/5.*Sx_plot*(S_plot.^(1/5)./(1+S_plot.^2).^(8/5));
St_plot = 6/5.*(Sx_plot.')*(S_plot.^(1/5)./(1+S_plot.^2).^(8/5));
plotter(St_plot, S_plot, Sx_plot);
plotter(St_plot, S_plot, Sx_plot)
%-- 2023-07-03 9:56 AM --%
Sx_plot = linspace(0.0001, 10, 1000);
S_plot = linspace(0.0001, 10, 1000);
St_plot = 6/5.*(Sx_plot.')*(S_plot.^(1/5)./(1+S_plot.^2).^(8/5));
plotter(St_plot, S_plot, Sx_plot)
addpath 'C:\Users\maggi\Documents\School ↵
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\HelperFunctions'
plotter(St_plot, S_plot, Sx_plot)
Sx_plot = linspace(0.0001, 2, 1000);
S_plot = linspace(0.0001, 2, 1000);
plotter(St_plot, S_plot, Sx_plot)
S_plot = linspace(0.0001, 1, 1000);
St_plot = 6/5.*(Sx_plot.')*(S_plot.^(1/5)./(1+S_plot.^2).^(8/5));
plotter(St_plot, S_plot, Sx_plot)
y = S_plot - Sx_plot
max(abs(y))
abs(y)
max(y)
simplified_solver
y = zeros([length(S)])
y = zeros(length(S))
length(S)
zeros(length(S));
simplified_solver
zeros([1, length(S)]);
simplified_solver
plot(x, h(1,:), x, h(10, :))
h_ref = h - h(1,:);
plot(x, h_ref(1, :), x, h_ref(10, :));
plot(x, h_ref(2, :), x, h_ref(3, :));
plot(x, h_ref(2, :), x, h_ref(3, :), x, h_ref(4, :), x, h_ref(5, :));
plot(x, h(1,:), x, h(2,:));
plot(x, h(1,:), x, real(h(2,:)));
simplified_solver
plot(x, h(1,:), x, real(h(2,:)));
h_ref = h - h(1,:);
plot(x, h_ref(2, :), x, h_ref(3, :), x, h_ref(4, :), x, h_ref(5, :));
plotter(real(h), x, t);
```

```
simplified_solver
plotter(x(1:7), h(1, 1:7), x(1:7), h(10, 1:7), x(1:7), h(50, 1:7), x(1:7), h(100, 1: ↙
7))
plott(x(1:7), h(1, 1:7), x(1:7), h(10, 1:7), x(1:7), h(50, 1:7), x(1:7), h(100, 1:7))
plot(x(1:7), h(1, 1:7), x(1:7), h(10, 1:7), x(1:7), h(50, 1:7), x(1:7), h(100, 1:7))
simplified_solver
plot(x(1:7), h(1, 1:7), x(1:7), h(10, 1:7), x(1:7), h(50, 1:7), x(1:7), h(100, 1:7))
simplified_solver
plot(x(1:7), h(1, 1:7), x(1:7), h(10, 1:7), x(1:7), h(50, 1:7), x(1:7), h(100, 1:7))
simplified_solver
plot(x(1:7), h(1, 1:7), x(1:7), h(10, 1:7), x(1:7), h(50, 1:7), x(1:7), h(100, 1:7))
simplified_solver
plot(x(1:7), h(1, 1:7), x(1:7), h(10, 1:7), x(1:7), h(50, 1:7), x(1:7), h(100, 1:7))
simplified_solver
plot(x(1:7), h(1, 1:7), x(1:7), h(10, 1:7), x(1:7), h(50, 1:7), x(1:7), h(100, 1:7))
simplified_solver
plot(x(1:7), h(1, 1:7), x(1:7), h(10, 1:7), x(1:7), h(50, 1:7), x(1:7), h(100, 1:7))
plot(x(1:7), h(1, 1:7), x(1:7), h(5, 1:7), x(1:7), h(10,1:7), x(1:7), h(15, 1:7))
plot(x(1:7), h(1, 1:7), x(1:7), h(5, 1:7), x(1:7), h(10,1:7), x(1:7), h(20, 1:7))
plot(x, h(1, :), x, h(2, :), x, h(3, :))
simplified_solver
plotter(h, x, t)
plotter(real(h), x, t)
1 + i
abs(1+i)
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
plot(x, h(1, :))
simplified_solver
plot(x, h(1, :))\
plot(x, h(1, :))
simplified_solver
plot(x, h(1, :))
plot(x, S(1,:))
simplified_solver
plot(x, S(1,:))
plot(x, h(1, :))
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plot(x, h(1, :))
simplified_solver
plot(x, h(1, :))
plotter(abs(h), x, t)
plot(x, h(1,:), x, h(2, :))
plot(x, h(1,:), x, h(3, :))
```

```
plot(x, h(1,:), x, h(5, :))
plot(x, h(1,:), x, h(10, :))
simplified_solver
plot(x, h(1,:), x, h(10, :))
plot(x, S(1,:), x, S(10, :))
simplified_solver
plot(x, S(1,:), x, S(10, :))\
plot(x, S(1,:), x, S(10, :))
simplified_solver
plot(x, S(1,:), x, S(10, :))
simplified_solver
plot(x, S(1,:), x, S(10, :))
simplified_solver
plot(x, S(1,:), x, S(10, :))
simplified_solver
plot(x, S(1,:), x, S(10, :))
plot(x, S(1,:), x, S(2, :))
simplified_solver
plot(x, S(1,:), x, S(2, :))
plot(x, S(1,:), x, S(2, :), x, S(2,:))
plot(x, S(1,:), x, S(2, :), x, S(3,:))
simplified_solver
plot(x, S(1,:), x, S(2, :), x, S(3,:))
plot(x, S(1,:), x, S(2, :), x, S(5,:))
plot(x, S(1,:))
simplified_solver
plot(x, S(1,:))
simplified_solver
plot(x, S(1,:))
plot(x, S(1,:), x, S(2, :), x, S(5,:))
plotter(real(S), x, t)
plot(x, S(1,:), x, S(2, :), x, S(10,:))
plot(x, S(1,:), x, S(5, :), x, S(10,:))
simplified_solver
cd 'C:\Users\maggi\Documents\School ↙
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\Simplified_Balance'
simplified_solver
plot(x, S(1,:), x, S(2, :), x, S(10,:))
plot(x, S(1,:), x, S(5, :), x, S(10,:))
plot(x, S(1,:), x, S(5, :), x, S(7,:))
simplified_solver
plot(x, S(1,:), x, S(5, :), x, S(7,:))
simplified_solver
plot(x, S(1,:), x, S(5, :), x, S(7,:))
simplified_solver
plot(x, S(1,:), x, S(5, :), x, S(7,:))
simplified_solver
plot(x, S(1,:), x, S(5, :), x, S(7,:))
plot(x, S(1,:))
simplified_solver
plot(x, S(1,:))
```

```
plot(x, S(1,:), x, S(5, :), x, S(7,:))
simplified_solver
plot(x, S(1,:), x, S(5, :), x, S(7,:))
plot(x, S(1,:))
simplified_solver
plot(x, S(1,:))
plot(x, h(1,:))
plot(x, S(1,:), x, S(5, :), x, S(7,:))
plot(x, h(1,:), x, h(5, :), x, h(7,:))
simplified_solver
plot(x, h(1,:), x, h(5, :), x, h(7,:))
plot(x, 10 -h(1,:), x, 10 -h(5, :), x, 10 - h(7,:))
simplified_solver
plot(x, h(1,:), x, h(5, :), x, h(7,:))
plot(x, 10 -h(1,:), x, 10 -h(5, :), x, 10 - h(7,:))
plot(x, h(100,:))
plot(x, h(80,:))
plot(x, h(1, :), x, h(80,:))
plotter(abs(Sx), x, t)
plotter(abs(Sx), x(1:80), t(1:800))
plotter(abs(Sx), x(1:800), t(1:80))
plotter(abs(Sx(1:80, 1:800)), x(1:800), t(1:80))
plot(x, S(1,:), x, S(5, :), x, S(7,:))
plot(x, S(1,:), x, S(50, :), x, S(100,:))
plot(x, S(1,:), x, S(50, :), x, S(70,:))
plot(x, S(1,:), x, S(20, :), x, S(40,:))
simplified_solver
plot(x, S(1,:), x, S(20, :), x, S(40,:))
S_diff = S - S(1,:)
plotter(S_diff, x, t)
plot(x, S_diff(2, :), x, S_diff(10, :))
h_diff = h - h(1, :)
plotter(h_diff, x, t)
plot(x, h_diff(50, :), x, h_diff(100, :))
simplified_solver
h_diff = h - h(1, :)
plotter(h_diff, x, t)
simplified_solver
h_diff = h - h(1, :)
plotter(h_diff, x, t)
plot(x, h_diff(2, :), x, h_diff(100, :))
plot(x, h_diff(2, :), x, h_diff(4, :))
plotter(S, x, t)
plot(x, S(1,:), x, S(5, :), x, S(7,:))
plotter(S, x, t)
plotter(Sx, x, t)
plot(x, Sx(1, :), x, Sx(10, :))
plot(x, Sx(10, :))
plot(x, St(10, :))
S_diff = S - S(1, :)
plot(x, S_diff(2,:), x, S_diff (3, :))
```

```
h_diff = h - h(1, :)
plot(x, h_diff(1,:), x, h_diff(10, :))
plot(x, h_diff(1,:), x, h_diff(2, :))
plot(x, h_diff(2,:), x, h_diff(3, :))
plot(x, h_diff(1,:), x, h_diff(4, :))
plot(x, h_diff(3,:), x, h_diff(4, :))
simplified_solver
h_diff = h - h(1, :)
plot(x, h_diff(2,:), x, h_diff(3, :))
simplified_solver
plot(x, h_diff(2,:), x, h_diff(3, :))
h_diff = h - h(1,:)
plot(x, h_diff(2,:), x, h_diff(3, :))
simplified_solver
h_diff = h - h(1,:)
plot(x, h_diff(2,:), x, h_diff(3, :))
plot(x, h_diff(2,:), x, h_diff(100, :))
simplified_solver
h_diff = h - h(1,:)
plot(x, h_diff(2,:), x, h_diff(100, :))
plot(x, h_diff(2,:), x, h_diff(3, :))
plot(x, h(1,:), x, h(2, :), x, h(3, :))
simplified_solver
plot(x, h(1,:), x, h(2, :), x, h(3, :))
simplified_solver
h_diff = h - h(1,:);
plot(x, h(1,:), x, h(2, :), x, h(3, :))
simplified_solver
plot(x, h(1,:), x, h(2, :), x, h(3, :))
plot(x, S(1, :))
plot(x, h(1,:), x, h(2, :), x, h(100, :))
plot(x, h(1,:), x, h(50, :), x, h(100, :))
plot(x, S(1,:), x, S(50, :), x, S(100, :))
plot(x, Sx(1,:), x, Sx(50, :), x, Sx(100, :))
plot(x, St(1,:), x, St(50, :), x, St(100, :))
plot(x, St(10,:), x, St(50, :), x, St(70, :),x, St(100, :))
plot(x, S(1,:), x, S(2, :))
simplified_solver
plot(x, S(1,:), x, S(2, :))
plot(x, St(10,:), x, St(50, :), x, St(70, :),x, St(100, :))
plot(x, Sx(1,:), x, Sx(50, :))
plot(x, St(1,:), x, St(2,:))
plot(x, Sx(1,:), x, Sx(1, :))
plot(x, Sx(1,:), x, Sx(2,:))
simplified_solver
plot(x, Sx(1,:), x, Sx(2,:))
simplified_solver
plot(x, Sx(1,:), x, Sx(2,:))
plot(x, S(1,:), x, S(2, :))
plot(x, S(1,:), x, S(10, :))
plot(x, S(1,:), x, S(100, :))
```

```matlab
plot(x, h(1,:), x, h(20,:))
simplified_solver
plot(x, h(1,:), x, h(20,:))
plot(x, h(1,:), x, h(40,:))
plot(x, h(1,:), x, h(20,:) x, h(40,:), x, h(100,:))
plot(x, h(1,:), x, h(20,:), x, h(40,:), x, h(100,:))
plot(x, S(1,:), x, S(20,:), x, S(40,:), x, S(100,:))
plot(x, h(1,:))
plot(x, Sx(1, :))
plot(x, Sx(1,:) - S(1,:))
plot(x, Sx(1,:) + S(1,:))
plot(x, St(1,:) - Q^(3/5))
plot(x, St(10,:) - Q^(3/5))
plot(x, St)
plot(x, Sx(1, :))
plot(x, Sx(2, :), x, Sx(5,:))
for i = 2:nx
Sxt = (St(:, i) - St(:, i-1))/dx;
end
Sxt(:, 1) = Sxt(2,:)
plotter(Sxt, x, t)
for i = 2:nx
Sxt(:, i) = (St(:, i) - St(:, i-1))/dx;
end
Sxt(1,:) = Sxt(2, :);
plotter(Sxt, x, t)
plotter(Sxt, Sx, St)
%-- 2023-07-04 10:16 AM --%
S = linspace(0, 5, 1000);
Sx = linspace(0, 2, 1000);
St_plot = 6/5.*(Sx_plot.')*(S_plot.^(1/5)./(1+S_plot.^2).^(8/5));
St_plot = 6/5.*(Sx.')*(S.^(1/5)./(1+S.^2).^(8/5));
plotter(St_plot, S, Sx);
title("St plotted against S and Sx")
xlabel("S");
ylabel("Sx");
simplified_solver
addpath 'C:\Users\maggi\Documents\School↙
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\HelperFunctions'
simplified_solver
plotter(Sxt, Sx, St)
xlabel("Sx")
ylabel("St")
title("Sxt")
plot(Sx(2,:), Sxt(2,:), Sx(10,:), Sxt(10,:));
plot(Sx(50,:), Sxt(50,:), Sx(100,:), Sxt(100,:));
St(1,:) = St(2, :)
Sxt(1,:) = Sxt(2, :);
simplified_solver
St(1, :) = St(2, :);
plotter(Sxt, x, t)
```

```matlab
Sxt(2,:) = Sxt(3,,:);
Sxt(2,:) = Sxt(3,:);
simplified_solver
max_incision = Sxt - 6/5.*Sx./S.*(St-Q^(3/5))
plotter(max_incision, x, t)
title("Sxt-6*Sx*(St - Q^3/5)/5S")
xlabel("x")
ylabel("t")
plotter(0, x, t)
plotter(zeros([nt,nx]), x, t)
simplified_solver
plotter(zeros([nt,nx]), x, t)
simplified_solver
plot(t, y_intersect)
title ("x value of max incision (St) point as a function of time ")
xlabel("x")\
xlabel("x")
xlabel("t")
ylabel("t")
ylabel("x")
simplified_solver
plot(t, max_h_func - y_intersect)
plot(t, max_h_func)
plot(t, h(:, 2))
max(h(1,:))
max(h(2,:))
max(h(3,:))
plot(x, h(1, :))
plot(x, h(100, :))
plot(x, h(1, :), x, h(100, :))
simplified_solver
max(ht(2,:))
plot(x, ht(2,:))
plot(x, ht(4,:))
plot(x, ht(100,:))
plot(x, S(100,:))
plot(x, S(10, :), x, S(100,:))
plot(t, ht(3,:))
plot(t, ht(:, 10))
plot(t, ht(:, 100))
plotter(ht, x, t)
simplified_solver
plot(t, max_h_func - y_intersect)
max(ht)
simplified_solver
plot(t, St(:, 10) -Q^(3/5) - y_intersect)
g = St(:, 10) -Q^(3/5) - y_intersect
plot(t, g)
plot(t, Sx(:, 10))
simplified_solver
g = St(:, 10) -Q^(3/5) - y_intersect
```

```
plot(t, g)
g = St(:, 10)' -Q^(3/5) - y_intersect
plot(t, g)
plot(t, Sx(:, 10))
plot(t, S(:, 10))
plot(x, S(10, :))
plot(x, Sx(10, :))
plot(x, St(10, :))
g = St(:, 10)' -S(:, 10).^(12/5).*Q^(4/5) - y_intersect
plot(t, g)
g = St(:, 10)' -S(:, 10).^(12/5)'.*Q^(4/5) - y_intersect
plot(t, g)
simplified_solver
plot(t, max_h_func)
plot(t, y_intersect - max_h_func)
plot(t, y_intersect, t, max_h_func)
legend("x point for critical dh/dt", "x point for max St")
simplified_solver
plot(t, y_intersect, t, max_h_func)
g = St - S.^(12/5).*Q^(4/5)
plot(x, g(4,:))
plot(x, g(6,:))
plot(t, g(:,10))
plot(t, y_intersect, t, g(:,10))
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
plot(x, S(1,:))
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
plot(x, h(100,:))
simplified_solver
plot(x, h(100,:))
plot(x, h(1000,:))
simplified_solver
plot(x, h(1000,:))\
plot(x, h(1000,:))
simplified_solver
plot(x, h(1000,:))
simplified_solver
```

```
plotter(abs(h), x, t)
plot(x, abs(h(100,:))
plot(x, abs(h(100,:)))
plot(x, abs(h(400,:)))
plot(x, abs(h(100,:)), x, abs(h(500, :)))
plot(x, abs(h(100,:)), x, abs(h(450, :)))
plot(x, abs(h(400,:)), x, abs(h(430, :)))
plot(x, abs(h(400,:)), x, abs(h(420, :)))
plotter(Sx, s, t)
plotter(Sx, x, t)
simplified_solver
plot(x, Sx(2, :))
plot(t, Sx(:, 2))
simplified_solver
plot(t,y_intersect)
simplified_solver
plot(t,y_intersect)
plot(x, S(100, :))
plot(x, S(276, :))
plot(x, h(276, :))
plot(x, h(408, :))
plot(x, h(418, :))
plot(x, h(420,:), x, h(421, :))
plot(x, h(420,:), x, h(abs(421), :))
plot(x, h(420,:), x, abs(h(421, :)))
plot(x, h(420,:), x, abs(h(422, :)))
plot(x, h(420,:), x, abs(h(423, :)))
simplified_solver
plot(t,y_intersect)
plot(x, h(1,:), x, abs(h(100, :)),  x, abs(h(400, :), x, abs(h(421, :)))
plot(x, h(1,:), x, abs(h(100, :)),  x, abs(h(400, :), x, abs(h(421, :))))
plot(x, h(1,:), x, abs(h(100, :)),  x, abs(h(400, :)), x, abs(h(421, :)))
plot(x, abs(h(100, :)),  x, abs(h(400, :)), x, abs(h(421, :)))
title("h across 20 km during roughly 1/3 of the melt season")
xlabel("x")
ylabel("h")
legend("t = 6 days", "t =24 days", "t = 26 days")
title("h across 20 km during roughly 1/2 of the melt season")
title("h across 20 km during less than 1/2 of the melt season")
simplified_solver
plot(x, h(1,:), x, abs(h(100, :)),  x, abs(h(400, :), x, abs(h(421, :)))
plot(x, abs(h(100, :)),  x, abs(h(400, :)), x, abs(h(421, :)))
plot(x, abs(h(100, :)),  x, abs(h(200, :)), x, abs(h(400, :)))
plot(x, abs(h(100, :)),  x, abs(h(150, :)), x, abs(h(200, :)))
simplified_solver
plot(x, abs(h(100, :)),  x, abs(h(150, :)), x, abs(h(200, :)))
plot(x, abs(h(10, :)),  x, abs(h(15, :)), x, abs(h(20, :)))
simplified_solver
plot(x, abs(h(10, :)),  x, abs(h(15, :)), x, abs(h(20, :)))
plot(x, abs(h(100, :)),  x, abs(h(200, :)), x, abs(h(400, :)))
plot(x, abs(h(100, :)),  x, abs(h(150, :)), x, abs(h(200, :)))
```

```
title("h across 20 km during 1/5 of the melt season")
xlabel("x")
ylabel("h")
legend("t = 6 days", "t =9 days", "t = 12 days")
simplified_solver
plot(x, abs(h(100, :)),  x, abs(h(150, :)), x, abs(h(200, :)))
plot(x, abs(h(10, :)),  x, abs(h(15, :)), x, abs(h(20, :)))
plot(x, h(1, :))
simplified_solver
plot(x, h(1, :))
simplified_solver
plot(x, h(1, :))
plot(x, h(1, :), x, h(2, :))
plot(x, h(1, :), x, h(50, :))
plot(x, h(1, :), x, h(4, :))
plot(x, h(1, :), x, h(5, :))
plot(x, S(1, :), x, S(4,:))
plot(x, S(1, :), x, S(10,:))
plot(x, S(1, :), x, S(7,:))
simplified_solver
plot(x, S(1, :), x, S(7,:))
plot(x, h(1, :), x, h(7,:))
plot(x, h(1, :), x, h(4,:), x, h(7,:))
simplified_solver
plot(x, h(1, :), x, h(4,:), x, h(7,:))
plot(x, h(1, :), x, h(2,:), x, h(3,:))
simplified_solver
plot(x, h(1, :), x, h(2,:), x, h(3,:))
simplified_solver
plot(x, h(1, :), x, h(2,:), x, h(3,:))
simplified_solver
plot(x, h(1, :), x, h(2,:), x, h(3,:))
simplified_solver
plot(x, h(1, :), x, h(2,:), x, h(3,:))
simplified_solver
plot(x, h(1, :), x, h(2,:), x, h(3,:))
plot(x, h(1, :), x, h(2,:))
plot(x, h(1, :)
plot(x, h(1, :))
plot(x, S(1, :), x, S(2, :))
plot(x, S(1, :), x, S(2, :), x, S(3, :))
simplified_solver
plot(x, h(1, :), x, h(2,:), x, h(3,:))
plot(x, S(1, :), x, S(2, :), x, S(3, :))
simplified_solver
plot(x, h(1, :), x, h(2,:), x, h(3,:))
simplified_solver
plot(x, h(1, :), x, h(2,:), x, h(3,:))
simplified_solver
plot(x, h(1, :), x, h(2,:), x, h(3,:))
plot(x, S(1, :), x, S(2,:), x, S(3,:))
```

```
plot(x, h(1, :), x, h(2,:), x, h(3,:))
plot(x, h(2, :), x, h(3,:), x, h(4,:))
plot(x, h(2, :), x, h(4,:), x, h(6,:))
simplified_solver
plot(x, h(2, :), x, h(4,:), x, h(6,:))
plot(x, h(4, :), x, h(5,:), x, h(6,:))
title("h across 10 km around 3 minutes after flux")
xlabel("x")
ylabel("h")
plot(x, h(4, :), x, h(5,:), x, h(6,:))
title("h across 10 km around 3 minutes after flux")
xlabel("x")
ylabel("h")
legend("t = 2 mins", "t =3 mins", "t = 4 mins")
simplified_solver
plot(x, h(4, :), x, h(5,:), x, h(6,:))
simplified_solver
plot(x, h(4, :), x, h(5,:), x, h(6,:))
simplified_solver
plot(x, h(4, :), x, h(5,:), x, h(6,:))
simplified_solver
plot(x, h(1, :))
simplified_solver
plot(x, h(4, :), x, h(5,:), x, h(6,:))
simplified_solver
plot(x, h(4, :), x, h(5,:), x, h(6,:))
plotter(St, x, t)
simplified_solver
plot(x, h(4, :), x, h(5,:), x, h(6,:))
simplified_solver
plot(x, h(100, :), x, h(500,:), x, h(1000,:))
plot(x, S(100, :), x, S(500,:), x, S(1000,:))
simplified_solver
plot(x, S(100, :), x, S(500,:), x, S(1000,:))
plot(x, h(100, :), x, h(500,:), x, h(1000,:))
simplified_solver
plot(x, h(100, :), x, h(500,:), x, h(1000,:))
simplified_solver
plot(x, h(100, :), x, h(500,:), x, h(1000,:))
simplified_solver
plot(x, h(100, :), x, h(500,:), x, h(1000,:))
simplified_solver
plot(x, h(100, :), x, h(500,:), x, h(1000,:))
plot(x, S(100, :), x, S(500,:), x, S(1000,:))
simplified_solver
plot(x, h(100, :), x, h(500,:), x, h(1000,:))
plot(x, S(100, :), x, S(500,:), x, S(1000,:))
simplified_solver
plot(x, h(100, :), x, h(500,:), x, h(1000,:))
simplified_solver
plot(x, h(100, :), x, h(500,:), x, h(1000,:))
```

```
plot(x, h(1,:))
simplified_solver
plot(x, h(1,:))
plot(x, h(1,:), x, h(2, :))
plot(x, h(1, :), x, h(100, :), x, h(500,:), x, h(1000,:))
title("h for concave ho, with hxo <0")
xlabel("x")
ylabel("h")
legend("t = 0", "t = 6 days", "t = 30 days", "t = 60 days")
plot(x, h(1, :), x, h(100, :), x, h(500,:), x, h(750, :), x, h(1000,:))
plot(x, h(1, :), x, h(100, :), x, h(500,:), x, h(600, :), x, h(700,:))
plot(x, h(1, :), x, h(100, :), x, h(500,:), x, h(550, :), x, h(600,:))
simplified_solver
plot(x, h(1, :), x, h(100, :), x, h(500,:), x, h(550, :), x, h(600,:))
plot(x, h(1, :), x, h(100, :), x, h(300,:), x, h(500, :), x, h(600,:))
plot(x, h(1, :), x, h(100, :), x, h(150,:), x, h(200, :), x, h(300,:))
plot(x, h(1, :), x, h(100, :), x, h(150,:), x, h(160, :), x, h(200,:))
plot(x, h(1, :), x, h(100, :), x, h(150,:), x, h(152, :), x, h(160,:))
plot(x, h(1, :), x, h(100, :), x, h(150,:), x, h(152, :), x, h(153,:))
plot(x, h(1, :), x, h(100, :), x, h(150,:), x, h(152, :), x, h(154,:))
plot(x, h(1, :), x, h(100, :), x, h(150,:), x, h(152, :), x, h(155,:))
plot(x, h(1, :), x, h(100, :), x, h(150,:), x, h(152, :), x, h(157,:))
title("h for concave ho")
xlabel("x")
ylabel("h")
legend("t = 0", "t = 6 days", "t = 9 days", "t = 9.1 days", "t = 9.5 days")
h-10 = h;
h_old_10 = h;
simplified_solver
plot(x, h(1, :), x, h(100, :), x, h(150,:), x, h(152, :), x, h(157,:))
h_Q_diff = h_old_10 - h;
plot(x, h_Q_diff(1, :), x, h_Q_diff(100, :), x, h_Q_diff(150,:), x, h_Q_diff(152, :), ↙
x, h_Q_diff(157,:))
plot(t, h_Q_diff(:, 100))
plot(t, h_Q_diff(:, 100), t, h_Q_diff(:, 200))
plot(t, h_Q_diff(:, 1), t, h_Q_diff(:, 100), t, h_Q_diff(:, 200))
plot(t, h_Q_diff(:, 1), t, h_Q_diff(:, 10), t, h_Q_diff(:, 20))
plot(x, h(100, :), x, h(500, :))
plot(x, h(100, :), x, h(500, :), x, h(100,:))
plot(x, h(100, :), x, h(500, :), x, h(1000,:))
plot(x, h(100, :), x, h(500, :), x, h(600,:))
plot(x, h(100, :), x, h(500, :), x, h(700,:))
plot(x, h(100, :), x, h(500, :), x, h(800,:))
plot(x, h(100, :), x, h(500, :), x, h(900,:))
simplified_solver
plot(x, h(100, :), x, h(500, :), x, h(900,:))
plot(x, h(100, :), x, h(500, :), x, h(800,:))
simplified_solver
plot(x, w(100, :), x, w(500, :), x, w(800,:))
plot(x, S(100, :), x, S(500, :), x, S(800,:))
plot(x, w(100, :), x, w(150, :), x, w(200,:))
```

```
plot(x, w(100, :), x, w(150, :), x, w(170,:))
plot(x, w(100, :), x, w(150, :), x, w(160,:))
plot(x, w(100, :), x, w(150, :), x, w(152,:))
wQ1 = w;
simplified_solver
w_diff = wQ1 - w;
plot(x, w_diff(100, :), x, w_diff(150, :), x, w_diff(152,:))
w_diff = -w_diff
plot(x, w_diff(100, :), x, w_diff(150, :), x, w_diff(152,:))
title("del_w for Q = 10^(-7) vs Q = 10^(-10)")
xlabel("x")
ylabel("del_w")
legend("t = 6 days", "t =9 days", "t = 9.2 days")
title("\Delta w for Q = 10^{-7} vs Q = 10^{-10}")
ylabel("\Delta w")
Steady_Q_solve
plot(x, h(100, :), x, h(500, :), x, h(800,:))
plot(x, h(100, :), x, h(500, :), x, h(800,:), x, h(1000, :))
plot(x, h(100, :), x, h(500, :), x, h(800,:), x, h(900, :))
plot(x, h(100, :), x, h(500, :), x, h(800,:), x, h(950, :))
Steady_Q_solve
plot(x, h(100, :), x, h(500, :), x, h(800,:), x, h(900, :))
plot(x, h(100, :), x, h(500, :), x, h(800,:), x, h(100, :))
plot(x, h(100, :), x, h(500, :), x, h(800,:), x, h(1000, :))
Steady_Q_solve
cd 'C:\Users\maggi\Documents\School ↙
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\Steady_Q'
Steady_Q_solve
simplified_solver
plot(x, h(100, :), x, h(500, :), x, h(800,:), x, h(1000, :))
h_simp = h;
cd 'C:\Users\maggi\Documents\School ↙
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\Steady_Q'
Steady_Q_solve
h_diff = h_simp - h;
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(1000, :))
title("\Delta h for small S assumption vs not")
xlabel("x")
ylabel("\Delta h = h_{small} - h")
legend("t = 6 days", "t =30 days", "t = 60 days")
title("\Delta h for small S assumption vs not, ho = -5 \cdot 10^{-6}x^2 + 10^{-5}x")
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(1000, :))
title("\Delta h for small S assumption vs not, ho = -5 \cdot 10^{-6}x^2 + 10^{-5}x, Q= ↙
10^{-7}")
legend("t = 6 days", "t =30 days", "t = 60 days")
ylabel("\Delta h = h_{small} - h")
xlabel("x")
Steady_Q_solve
h_f = h;
Steady_Q_solve
cd 'C:\Users\maggi\Documents\School ↙
```

```
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\Steady_Q'
Steady_Q_solve
h_f = h;
simplified_solver
cd 'C:\Users\maggi\Documents\School ↙
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\Simplified_Balance'
simplified_solver
h_diff = h_f -h;
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(1000, :))
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(800, :))
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(1000, :))
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(950, :))
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(900, :))
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(700, :))
title("\Delta h for regular vs small S, ho = -5 \cdot 10^{-6}x^2 + 10^ ↙
{-5}x, Q= 10^ ↙
{-7}")
xlabel("x")
ylabel("h")
legend("t = 6 days", "t =30 days", "t = 42 days")
ylabel("\Delta h = h - h_{small}")
Steady_Q_solve
cd 'C:\Users\maggi\Documents\School ↙
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\Steady_Q'
Steady_Q_solve
h_diff = h_f -h;
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(700, :))
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(1000, :))
Steady_Q_solve
h_diff = h_f -h;
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(1000, :))
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(700, :))
h_diff = h_f -h;
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(700, :))
Steady_Q_solve
h_diff = h_f -h;
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(700, :))
plot(x, h(100, :), x, h(500, :), x, h(800,:), x, h(100, :))
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(1000 :))
plot(x, h_diff(100,:), x, h_diff(500, :), x, h_diff(1000, :))
plot(x, h(100,:), x, h(500, :), x, h(1000, :))
Steady_Q_solve
plot(x, h(100,:), x, h(500, :), x, h(1000, :))
plot(x, h(100,:), x, h(500, :), x, h(800, :))
plot(t, h_x_0)
plot(t, S(:, 1))
Steady_Q_solve
plot(t, S(:, 1))
h_x_0
plot(t, h_x_0)
Steady_Q_solve
plot(t, h_x_0)
```

```
Steady_Q_solve
plot(t, h_x_0)
plot(t, S(:, 1))
Steady_Q_solve
plot(t, S(:, 1))
plotter(h, x, t)
plotter(abs(h), x, t)
plot(x, h(60,:), x, h(80,:))
plot(x, abs(h(20, :)),x, abs(h(60,:)), x, abs(h(80,:)))
plot(x, h(20,:), x, h(30,:))
plot(x, h(20,:), x, h(30,:), x h(40,:))
plot(x, h(20,:), x, h(30,:), x, h(40,:))
plot(x, h(20,:), x, h(30,:), x, h(40,:), x, abs(h(50,:))
plot(x, h(20,:), x, h(30,:), x, h(40,:), x, abs(h(50,:)))
plot(x, h(20,:), x, h(30,:), x, h(40,:), x, abs(h(45,:))
plot(x, h(20,:), x, h(30,:), x, h(40,:), x, abs(h(45,:)))
plot(x, h(20,:), x, h(30,:), x, h(40,:), x, abs(h(45,:)), x, abs(h(47,:)))
plot(x, h(20,:), x, h(30,:), x, h(40,:), x, abs(h(45,:)), x, abs(h(48,:)))
Steady_Q_solve
plot(t, S(:, 1))
Steady_Q_solve
plot(t, S(:, 1))
Steady_Q_solve
plot(t, S(:, 1))
Steady_Q_solve
plot(t, S(:, 1))
plot(t, St(:, 1))
Steady_Q_solve
plot(t, St(:, 1))
plot(t, S(:, 1))
Steady_Q_solve
plot(t, S(:, 1))
plotter(abs(h), x, t)
plot(x, h(1,:), x, h(1000, :))
Steady_Q_solve
plot(t, S(:, 1))
plot(x, h(1,:), x, h(1000, :))
Steady_Q_solve
plot(x, h(1,:), x, h(1000, :))
plot(x, S(1,:), x, S(20,:))
plot(x, S(1,:), x, S(50,:))
v = linspace(10^{-10}, 10^{-6}, 10000);
v = linspace(1e-10, 1e-6, 10000);
S = linspace(1e-5, 1, 10000);
Q = 10^{-10}
Q = 1e-10
S_p = (-5/2.*(S.^(12/5).*(1 + S.^2).^(3/10)).*Q^(1/5) + 5/2.*Q^(-2/5).*(S.^(6/5).*(1 + ↵
S.^2).^(9/10)).*v.'.*S)
plotter(S_p, S, v)
xlabel("S")
%-- 2023-07-05 2:40 PM --%
```

```matlab
v = linspace(1e-9, 1e-6, 1000)
S = linspace(1e-6, 0.6, 1000)
Q = 1e-9
S_p = (-5/2.*(S.^(12/5).*(1 + S.^2).^(3/10)).*Q^(1/5) + 5/2.*Q^(-2/5).*(S.^(6/5).*(1 + ↵
S.^2).^(9/10)).*v.'.*S);
plotter(S_p, S, v)
addpath 'C:\Users\maggi\Documents\School ↵
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\HelperFunctions'
plotter(S_p, S, v)
v = linspace(1e-10, 1e-6, 1000)
S = linspace(1e-6, 1, 1000);
S_p = (-5/2.*(S.^(12/5).*(1 + S.^2).^(3/10)).*Q^(1/5) + 5/2.*Q^(-2/5).*(S.^(6/5).*(1 + ↵
S.^2).^(9/10)).*v.'.*S);
plotter(S_p, S, v)
v = linspace(1e-10, 1e-6, 10000);
S = linspace(1e-6, 1, 1000);
S_p = (-5/2.*(S.^(12/5).*(1 + S.^2).^(3/10)).*Q^(1/5) + 5/2.*Q^(-2/5).*(S.^(6/5).*(1 + ↵
S.^2).^(9/10)).*v.'.*S);
plotter(S_p, S, v)
plotter(S_p, v, S)
S = linspace(1e-5, 1, 10000);
plotter(S_p, S, v)
S_p = (-5/2.*(S.^(12/5).*(1 + S.^2).^(3/10)).*Q^(1/5) + 5/2.*Q^(-2/5).*(S.^(6/5).*(1 + ↵
S.^2).^(9/10)).*v.'.*S);
plotter(S_p, S, v)
xlabel("S")
ylabel("v")
S = linspace(1e-10, 1, 1000);
Q = 1e-10
S_p = (-5/2.*(S.^(12/5).*(1 + S.^2).^(3/10)).*Q^(1/5) + 5/2.*Q^(-2/5).*(S.^(6/5).*(1 + ↵
S.^2).^(9/10)).*v.'.*S);
plotter(S_p, S, v)
xlabel("S")
ylabel("v")
zlabel("\frac{\partial S}{\partial t}")
zlabel("S_t")
title("Phase plot of S_t for Q = 10^{-10}")
plot(v, S_p(:, 500))
S(500)
plot(v, S_p(:, 700))
plot(v, S_p(:, 1000))
v(500)
v(450)
v(250)
v(100)
plot(S, S_p(100, :))
y_label("S_p")
ylabel("S_p")
xlabel("x")
title("S_t vs S for v = 10^{-8}, Q = 10^{-10}")
xlabel("S")
```

```matlab
ylabel("S_t")
Steady_Q_solve
plotter(abs(h), x, t)
Steady_Q_solve
plotter(abs(h), x, t)
Steady_Q_solve
h_Q = h
plot(x, h(100,:))
plot(x, h(1000,:))
Steady_Q_solve
plot(x, h(1000,:))
plot(x, h(100,:))
plot(t, S(:, 1))
h_Q = h;
simplified_solver
h_diff = h_Q - h;
plotter(abs(h_diff), x, t)
Steady_Q_solve
plotter(abs(h), x, t)
h_Q = h;
simplified_solver
h_diff = h_Q - h;
plotter(h_diff, x, t)
plot(t, h_diff(:,1))
simplified_solver
h_small = h;
Steady_Q_solve
h_diff = h - h_small;
plot(t, h_diff(:, 1))
plotter(h_diff, x, t)
%-- 2023-07-06 10:46 AM --%
simplified_solver
cd 'C:\Users\maggi\Documents\School ⤦
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\Simplified_Balance'
simplified_solver
Conc_change = ht - S.^(6/5).*Q^(3/5);
plotter(Conc_change, x, t)
simplified_solver
plotter(abs(h), x, t)
plot(x, h(600,:))
plot(x, h(600,:), x, h(1600,:))
plot(x, h(600,:), x, h(800,:))
plot(x, S(600, :), x, S(800,:))
plot(x, S(200,:), S(600, :), x, S(800,:))
plot(x, S(200,:), x, S(600, :), x, S(800,:))
plot(x, S(100,:), x, S(200, :), x, S(300,:))
plot(x, S(100,:), x, S(150, :), x, S(200,:))
simplified_solver
plot(x, S(100,:), x, S(150, :), x, S(200,:))
simplified_solver
plot(x, S(100,:), x, S(150, :), x, S(200,:))
```

```
plot(x, S(1,:))
simplified_solver
plot(x, S(1,:))
plot(x, S(100,:), x, S(150, :), x, S(200,:))
plot(x, S(100,:), x, S(200, :), x, S(300,:))
plot(x, S(100,:), x, S(200, :), x, S(500,:))
plot(x, S(100,:), x, S(200, :), x, S(600,:))
plot(x, h(600,:), x, h(800,:))
plot(x, h(600,:), x, h(1000,:))
plot(x, h(600,:), x, h(900,:))
plot(x, h(600,:), x, h(850,:))
plot(x, h(600,:), x, h(800,:))
plot(x, Sxx(600,:))
plot(x, Sx(600,:))
plot(x, Sx(600,:),x, h(600,:))
plot(x, Sx(600,:),x, ht(600,:))
plot(x, ht(600,:))
plot(x, Sx(600,:),x, St(600,:))
plot(x, St(600,:))
plot(x, Sx(600,:))
plot(x, St(600,:))
proxy = S^(6/5)*Q^(3/5)-ht;
proxy = S.^(6/5).*Q.^(3/5)-ht;
plot(x, proxy(600,:))
plot(x, proxy(600,:), x, St(600, :))
simplified_solver
plot(abs(h), x, t)
plotter(abs(h), x, t)
plotter(x, h(500,:))
plot(x, h(500,:))
plot(x, h(400,:))
plot(x, h(300,:))
simplified_solver
plot(x, h(300,:))
plot(x, h(1,:))
plot(x, h(1,:), x, h(2,:))
simplified_solver
plot(x, h(1,:), x, h(2,:))
simplified_solver
plot(x, h(1,:), x, h(2,:))
plot(x, ht(1,:), x, ht(2,:))
plot(x, St(1,:), x, St(2,:))
plot(x, St(1,:), x, St(100,:))
plot(x, St(1,:), x, St(10,:))
plot(x, St(1,:), x, St(5,:))
plot(x, St(1,:), x, St(40,:))
plot(x, St(1,:), x, St(20,:))
plot(x, S(1,:), x, Sx(1, :), x, St(1, :))
plot(x, S(1,:), x, S(2,:))
plot(x, Sx(1,:), x, Sx(2,:))
simplified_solver
```

```
plot(x, S(1,:), x, S(2,:))
plot(x, S(1,:), x, St(1,:))
plotter(abs(St), abs(S), abs(Sx))
plot(x, S(3,:), x, St(3,:))
plot(x, Sx(3,:), x, St(3,:))
plot(x, S(3,:) - Sx(3,:), x, St(3,:))
plotter(abs(St), abs(S), abs(ht))
h_t = linspace(1e-13, 1, 1000)l
h_t = linspace(1e-13, 1, 1000);
S_plot = linspace(1e-5, 1, 1000)l
S_plot = linspace(1e-5, 1, 1000);
St_plot = 5/2*S_plot.'.^(6/5).*Q^(-2/5).*(S_plot.'.^(6/5).*Q^(3/5) - h_t);
plotter(St_plot, S_plot, h_t);
xlabel("S")
ylabel("h_t")
St_plot = 5/2*S_plot.'.^(6/5).*Q^(-2/5).*(-S_plot.'.^(6/5).*Q^(3/5) + h_t);
plotter(St_plot, S_plot, h_t);
xlabel("S")
ylabel("h_t")
St_plot = 5/2*S_plot.'.^(6/5).*(-S_plot.'.^(6/5)+ h_t);
plotter(St_plot, S_plot, h_t);
St_plot = 5/2*S_plot.'.^(6/5).*(1e-4)^(-2/5).*(-S_plot.'.^(6/5).*(1e-4)^(3/5) + h_t);
plotter(St_plot, S_plot, h_t);
St_plot = 5/2*S_plot.'.^(6/5).*(1e-2)^(-2/5).*(-S_plot.'.^(6/5).*(1e-2)^(3/5) + h_t);
plotter(St_plot, S_plot, h_t);
St_plot = 5/2*S_plot.'.^(6/5).*(1e-1)^(-2/5).*(-S_plot.'.^(6/5).*(1e-1)^(3/5) + h_t);
plotter(St_plot, S_plot, h_t);
xlabel("S")
ylabel("h_t")
simplified_solver
plotter(h, x, t);
plotter(S, x, t);
xlabel("x")
ylabel("t")
plot(x, S(1,:), x, S(1000,:))
plot(x, h(1,:), x, h(1000,:))
simplified_solver
plotter(St_plot, S_plot, h_t);
plotter(h, x, t);
plot(x, S(1,:), x, S(1000,:))
plot(x, h(1,:), x, h(1000,:))
simplified_solver
plot(x, h(1,:), x, h(1000,:))
simplified_solver
plot(x, h(1,:), x, h(1000,:))
plot(x, h(1,:), x, h(500,:), x, h(1000,:))
plot(x, h(1,:), x, h(50,:), x, h(1000,:))
plot(x, h(1,:), x, h(50,:), x, h(100,:))
simplified_solver
plot(x, h(1,:), x, h(1000,:))
plot(x, S(1,:), x, S(1000,:))
```

```
plot(x, Sx(1,:), x, Sx(1000,:))
plot(x, St(1,:), x, St(1000,:))
simplified_solver
plot(x, St(1,:), x, St(1000,:))
simplified_solver
plot(x, St(1,:), x, St(1000,:))
plot(x, h(1,:), x, h(1000,:))
plot(x, S(1,:), x, S(1000,:))
simplified_solver
plot(x, St(1,:), x, St(1000,:))
plot(x, h(1,:), x, h(1000,:))
plot(x, h(1,:), x, h(100:))
plot(x, h(1,:), x, h(100,:))
plot(x, h(1,:), x, h(10,:))
plot(x, h(1,:), x, h(2,:))
plot(x, h(1,:), x, h(5,:))
plot(x, h(1,:), x, h(3,:))
simplified_solver
plot(x, St(1,:), x, St(1000,:))
plot(x, h(1,:), x, h(1000,:))
plot(x, h(1,:), x, h(5,:))
plot(x, h(1,:), x, h(100,:))
plot(x, h(1,:), x, h(200,:))
plot(x, h(1,:), x, h(150,:))
simplified_solver
plot(x, h(1,:), x, h(1000,:))
plot(x, St(1,:), x, St(1000,:))
simplified_solver
plot(x, St(1,:), x, St(1000,:))
simplified_solver
plot(x, h(100,:), x, h(1000,:))
simplified_solver
plot(x, h(100,:), x, h(1000,:))
plot(x, h(10,:))
plot(x, h(1,:))
plot(x, h(1,:), x, h(2,:))
plot(x, h(2,:))
plot(x, S(2,:))
plot(x, S(1, :), x, S(2,:))
simplified_solver
plot(x, S(1, :), x, S(2,:))
simplified_solver
plot(x, S(1, :), x, S(2,:))
plot(x, S(1, :), x, S(10,:))
plot(x, S(1, :), x, S(100,:))
simplified_solver
plot(x, S(1, :), x, S(100,:))
plot(x, S(1, :), x, S(10,:))
simplified_solver
plot(x, S(1, :), x, S(1000,:))
simplified_solver
```

```
plot(x, S(1, :), x, S(1000,:))
simplified_solver
plot(x, St(1,:), x, St(1000,:))
simplified_solver
plot(x, St(1,:), x, St(1000,:))
simplified_solver
plot(x, St(1,:), x, St(1000,:))
plot(x, S(1,:), x, S(1000,:))
plot(x, h(1,:), x, h(1000,:))
plot(x, h(1,:), x, h(10,:))
plot(x, h(1,:), x, h(100,:))
plot(x, S(1,:), x, S(100,:))
plot(x, S(1,:), x, S(500, :))
plot(x, S(1,:), x, S(800, :))
plot(x, St(1,:), x, St(100,:))
plot(x, St(1,:), x, St(500,:))
simplified_solver
plot(x, St(1,:), x, St(500,:))
plot(x, St(1,:), x, St(5000,:))
plot(x, St(1,:), x, St(2000,:))
plot(x, St(1,:), x, St(1500,:))
plot(x, St(1,:), x, St(1200,:))
plot(x, St(1,:), x, St(1000,:))
plot(x, S(1,:), x, S(1000,:))
plot(x, S(1,:), x, S(2000,:))
plot(x, S(1,:), x, S(5000,:))
plot(x, S(1,:), x, S(10000,:))
simplified_solver
plotter(St, x, t)
plot(x, S(1,:), x, S(10000,:))
plot(x, S(1,:), x, S(5000,:))
plot(x, S(1,:), x, S(1000,:))
plot(x, S(1,:), x, S(1000,:), x, S(5000,:), x, S(10000,:))
plot(x, S(1000,:), x, S(2000,:), x, S(5000,:), x, S(10000,:))
plot(x, S(1000,:), x, S(1500,:), x, S(2000,:), x, S(10000,:))
xlabel("x")
ylabel("h_x)
ylabel("h_x")
title("Slope evolution given Q = 0.5, v = 10^{-6}, initial tanh profile")
legend("t = 35 days", "t = 53 days", "t = 70 days", "t = 353 days")
simplified_solver
plot(x, S(1000,:), x, S(1500,:), x, S(2000,:), x, S(10000,:))
plot(x, S(100,:), x, S(150,:), x, S(200,:), x, S(1000,:))
plot(x, S(100,:), x, S(500,:), x, S(700,:), x, S(1000,:))
title("Slope evolution given Q = 0.05, v = 10^{-6}, initial tanh profile")
ylabel("h_x")
xlabel("x")
legend("t = 35 days", "t = 175 days", "t = 245 days", "t = 353 days")
simplified_solver
plot(x, S(100,:), x, S(500,:), x, S(700,:), x, S(1000,:))
simplified_solver
```

```matlab
plot(x, S(100,:), x, S(500,:), x, S(700,:), x, S(1000,:))
plot(x, h(100,:), x, h(500,:), x, h(700,:), x, h(1000,:))
plot(x, h(100,:), x, h(500,:), x, h(700,:), x, h(10000,:))
plot(x, h(100,:), x, h(500,:), x, h(7000,:), x, h(10000,:))
simplified_solver
plot(x, h(100,:), x, h(500,:), x, h(7000,:), x, h(10000,:))
plot(x, h(1,:), x, h(500,:), x, h(7000,:), x, h(10000,:))
plot(x, h(10,:), x, h(500,:), x, h(7000,:), x, h(10000,:))
plot(x, h(10,:), x, h(50,:), x, h(100,:), x, h(200,:))
plot(x, h(10,:), x, h(50,:), x, h(100,:), x, h(300,:))
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
plot(x, h(1,:), x, h(100, :), x, h(1000,:))
plot(x, h(1,:), x, h(10, :), x, h(500, :), x, h(1000,:))
plot(x, h(1,:), x, h(10, :), x, h(200, :), x, h(1000,:))
plot(x, h(1,:), x, h(10, :), x, h(50, :), x, h(200,:))
plot(x, h(1,:), x, h(10, :), x, h(20, :), x, h(200,:))
plot(x, h(1,:), x, h(10, :), x, h(30, :), x, h(200,:))
plot(x, h(1,:), x, h(10, :), x, h(20, :), x, h(30,:))
plot(x, h(1,:), x, h(10, :), x, h(20, :), x, h(70,:))
plot(x, h(1,:), x, h(10, :), x, h(20, :), x, h(40,:))
plot(x, h(1,:), x, h(10, :), x, h(20, :), x, h(25,:))
plot(x, h(1,:), x, h(10, :), x, h(20, :), x, h(23,:))
plot(x, h(1,:), x, h(10, :), x, h(20, :), x, h(23,:), x, h(200,:))
plot(x, h(1,:), x, h(10, :), x, h(20, :), x, h(23,:), x, h(100,:))
plot(x, h(1,:), x, h(10, :), x, h(20, :), x, h(23,:), x, h(40,:))
xlabel("x")
ylabel("h")
title("Profile evolution given Q = 5 10^{-5}, v = 10^{-6}, initial tanh profile")
legend("t = 0", "t = 4 days", "t = 8 days", "t = 8.2 days", "t = 14 days")
simplified_solver
plotter(abs(h), x, t)
plot(x, S(1, :), x, S(1000,:))
simplified_solver
plot(x, S(1, :), x, S(1000,:))
simplified_solver
plot(x, S(1, :), x, S(1000,:))
```

```
plot(x, h(1,:), x, h(1000, :))
plot(x, h(1,:), x, h(100, :))
plot(x, S(1, :), x, S(100,:))
simplified_solver
plot(x, S(1, :), x, S(100,:))
plot(x, S(1, :), x, S(1000,:))
plot(x, S(1, :), x, S(500,:))
plot(x, S(1, :), x, S(10,:))
S_diff = S - S(1,:)
plotter(S_diff, x, t)
plot(x, S_diff(100, :), x, S_diff(1000,:))
S_diff = S - S(1,:)
simplified_solver
plot(x, S(1, :), x, S(100,:))
simplified_solver
plot(x, S(1, :), x, S(100,:))
plot(x, h(1, :), x, h(100,:))
plot(x, ht(1, :), x, ht(100,:))
simplified_solver
plot(x, ht(1, :), x, ht(100,:))
plot(x, ht(1, :), x, ht(10,:))
simplified_solver
plot(x, ht(1, :), x, ht(10,:))
simplified_solver
plot(x, ht(1, :), x, ht(10,:))
plot(x, S(1, :), x, S(10,:))
plot(x, h(1, :), x, h(100,:))
plot(t, ht(:, 1))
plot(x, S(1, :), x, S(10,:))
S(10,:) - S(1, :);
plot(x, S(10,:) - S(1, :));
S(10,:) - S(1, 3)
S(10,3) - S(1, 3)
plot(x, S(1, :), x, S(10,:))
plot(x, Sx(1, :), x, Sx(10,:))
plot(x, Sx(1, :))
plot(x, St(1, :))
plot(x(1:50), St(1, 1:50))
plot(x(1:50), St(10, 1:50))
plot(x(950:1000), St(10, 950:1000))
plot(x(450:500), St(10, 450:500))
plot(x(1:50), St(10, 1:50))
plot(x, St(3,:))
plot(x, Sx(3,:))
plot(x, S(10,:) - S(3,:))
plot(x, h(1, :), x, h(10,:))
simplified_solver
plot(x, abs(h(1, :)), x, abs(h(10,:)))
plot(x, abs(h(1, :)), x, abs(h(100,:)))
simplified_solver
plot(x, abs(h(1, :)), x, abs(h(100,:)))
```

```
simplified_solver
plot(x, abs(h(1, :)), x, abs(h(100,:)))
simplified_solver
plot(x, abs(h(1, :)), x, abs(h(100,:)))
simplified_solver
plot(x, abs(h(1, :)), x, abs(h(100,:)))
simplified_solver
plot(x, abs(h(1, :)), x, abs(h(100,:)))
plot(x, abs(h(1, :)), x, abs(h(1000,:)))
plot(x, abs(S(1, :)), x, abs(S(1000,:)))
simplified_solver
plot(x, abs(S(1, :)), x, abs(S(1000,:)))
simplified_solver
plot(x, abs(S(1, :)), x, abs(S(1000,:)))
simplified_solver
plot(x, abs(S(1, :)), x, abs(S(1000,:)))
plot(x, abs(h(1, :)), x, abs(h(1000,:)))
plot(x, abs(h(1, :)), x, abs(h(100,:)))
plot(x, abs(S(1, :)), x, abs(S(100,:)))
simplified_solver
plot(x, abs(h(1, :)), x, abs(h(100,:)))
plot(x, abs(S(1, :)), x, abs(S(100,:)))
plot(x, abs(S(1, :)), x, abs(S(2,:)))
plot(x, abs(S(1, :)), x, abs(S(3,:)))
simplified_solver
plot(x, abs(h(1, :)), x, abs(h(100,:)))
plot(x, abs(S(1, :)), x, abs(S(3,:)))
plot(x, abs(S(1, :)), x, abs(S(100,:)))
plot(x x, abs(S(100,:)))
plot(x, abs(S(100,:)))
simplified_solver
plot(x x, abs(S(100,:)))
simplified_solver
plot(x, abs(S(1, :)), x, abs(S(100,:)))
simplified_solver
%-- 2023-07-10 9:03 AM --%
simplified_solver
plot(x, h(1, :), x, h(100, :))
plot(x, h(1, :), x, h(1000, :))
plot(x, h(1, :), x, h(200, :))
200*10
plot(x, ht(200,:))
simplified_solver
plot(x, ht(200,:))
plot(x, h(1, :), x, h(200, :))
simplified_solver
plot(x, h(1, :), x, h(200, :))
plot(x, ht(200,:))
plot(x, S(200,:))
plot(x, S(200,:), x, ht(200,:))
plot(ht(200,:), S(20,:))
```

```
plot(ht(200,:), S(200,:))
plot(ht(20,:), S(20,:))
plot(ht(1000,:), S(1000,:))
plot(ht(100,:), S(100,:))
plot(ht(500,:), S(500,:))
plot(ht(300,:), S(300,:))
plot(ht(300,:), S(300,:), ht(10,:), S(10, :))
plot(ht(10,:), S(10, :))
plot(S(10,:), ht(10, :))
plot(x, St(10,:), x, Sx(10,:))
plot(x, St(200,:), x, Sx(200,:))
plot(x, St(100,:), x, Sx(100,:))
plot(x, St(100,:))
plot(x, St(100,:)*10, x, Sx(100,:))
plot(x, St(100,:)*1000, x, Sx(100,:))
plot(x, St(100,:)*100, x, Sx(100,:))
plot(x, St(100,:)*500, x, Sx(100,:))
plot(x, St(10,:)*500, x, Sx(10,:))
simplified_solver
plot(x, h(1, :), x, h(200, :))
plot(x, S(1, :), x, S(200, :))
plot(x, S(1, :), x, S(10, :), x, S(100,:))
plot(x, S(1, :), x, S(10, :), x, S(100,:), x, S(1000,:))
plot(x, S(1, :), x, h(100, :), x, h(500,:), x, h(1000,:))
plot(x, h(1, :), x, h(100, :), x, h(500,:), x, h(1000,:))
plot(x, S(1, :), x, S(10, :), x, S(100,:))
plot(x, S(1, :), x, S(10, :), x, S(100,:), x, S(1000))
plot(x, S(1, :), x, S(10, :), x, S(100,:), x, S(1000,:))
simplified_solver
plot(x, S(1, :), x, S(10, :), x, S(100,:), x, S(1000,:))
simplified_solver
plot(x, S(1, :), x, S(10, :), x, S(100,:), x, S(1000,:))
simplified_solver
plot(x, S(1, :), x, S(10, :), x, S(100,:), x, S(1000,:))
plot(x, S(1, :), x, S(10, :), x, S(100,:), x, S(400,:))
2
plot(x, S(1, :), x, S(10, :), x, S(100,:), x, S(200,:))
simplified_solver
plot(x, S(1, :), x, S(10, :), x, S(100,:), x, S(200,:))
plot(x, h(1, :), x, h(100, :), x, h(500,:), x, h(1000,:))
simplified_solver
plot(x, h(1, :), x, h(100, :), x, h(500,:), x, h(1000,:))
plot(x, h(1, :), x, h(10, :), x, h(50,:), x, h(100,:))
plot(x, h(1, :), x, h(2, :), x, h(3,:), x, h(4,:))
simplified_solver
plot(x, h(1, :), x, h(10, :), x, h(50,:), x, h(100,:))
plot(x, h(1, :), x, h(10, :), x, h(50,:), x, h(1000,:))
plot(x, h(1, :), x, h(10, :), x, h(500,:), x, h(1000,:))
plot(x, S(1, :), x, S(100, :), x, S(500,:), x, S(1000,:))
plot(x, S(1, :), x, S(100, :), x, S(500,:), x, S(700,:))
plot(x, S(1, :), x, S(10, :), x, S(50,:), x, S(70,:))
```

```
plot(x, S(100, :), x, S(200, :), x, S(500,:), x, S(700,:))
plotter(S, x, t)
plotter(h, x, t)
plot(x, h(700, :), x, h(800,:), x, h(900,:), x, h(1000,:))
simplified_solver
plotter(h, x, t);
plot(x, h(10,:), x, h(20,:), x, h(40,:))
simplified_solver
plot(x, h(10,:), x, h(20,:), x, h(40,:))
plot(x, h(700, :), x, h(800,:), x, h(900,:), x, h(1000,:))
plot(x, S(700, :), x, S(800,:), x, S(900,:), x, S(1000,:))
simplified_solver
plot(x, h(1,:), x, h(10,:), x, h(50,:), x, h(100,:))
plot(x, h(1,:), x, h(10,:), x, h(50,:), x, h(70,:))
plot(x, h(1,:), x, h(10,:), x, h(50,:))
plot(x, h(1,:), x, h(10,:), x, h(50,:), x, h(200,:))
simplified_solver
plot(x, h(700, :), x, h(800,:), x, h(900,:), x, h(1000,:))
plot(x, h(1,:), x, h(10,:), x, h(50,:), x, h(100,:))
plot(x, h(1,:), x, h(10,:), x, h(50,:), x, h(60,:))
plot(x, h(1,:), x, h(10,:), x, h(50,:))
plot(x, h(1,:), x, h(10,:))
plot(x, h(1,:), x, h(5,:), x, h(10,:))
plotter(h, x, t);
simplified_solver
plot(x, h(1,:), x, h(5,:), x, h(10,:))
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
```

```
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
simplified_solver
plotter(h, x, t);
plotter(S, x, t);
plot(x, S(1, :), x, S(100,:), x, S(500,:))
simplified_solver
plot(x, S(1, :), x, S(100,:), x, S(500,:))
simplified_solver
plot(x, S(1, :), x, S(100,:), x, S(500,:))
simplified_solver
plot(x, h(1, :), x, h(500,:))
proxy = ht(2,:) - S(1,:).^(6/5).*Q^(3/5)
plot(x, proxy)
simplified_solver
plot(x, h(1, :), x, h(500,:))
plot(x, S(1, :), x, S(500,:))
proxy = ht(2,:) - S(1,:).^(6/5).*Q^(3/5);
plot(x, proxy)
plot(t, S(:,1))
proxy = ht(1,:) - S(1,:).^(6/5).*Q^(3/5);
plot(x, proxy)
simplified_solver
plot(x, S(1, :), x, S(500,:))
plot(x, h(1, :), x, h(500,:))
simplified_solver
plot(x, S(1, :), x, S(500,:))
simplified_solver
plot(x, S(1, :), x, S(500,:))
proxy = ht(1,:) - S(1,:).^(6/5).*Q^(3/5);
plot(x, proxy)
proxy = ht(1,:) - S(1,1).^(6/5).*Q^(3/5);
plot(x, proxy)
simplified_solver
proxy = ht(1,:) - S(1,1).^(6/5).*Q^(3/5)
plot(x, proxy)
plot(t, h_x_0)
proxy = ht(:,1) - S(1,1).^(6/5).*Q^(3/5)
plot(t, proxy)
plot(t, S(:, 1), t, S(:, 500))
plot(t, S(:, 1), t, S(:, 10))
plotter(ht, x, t)
plotter(ht(3:500, :), x, t(3:500))
simplified_solver
proxy = ht(:,1) - S(1,1).^(6/5).*Q^(3/5)
plot(t, S(:, 1), t, S(:, 500))
simplified_solver
plot(t, S(:, 1), t, S(:, 500))
plot(x, S(1, :), x, S(500,:))
```

```
plotter(ht(3:500, :), x, t(3:500))
simplified_solver
plotter(ht(3:500, :), x, t(3:500))
simplified_solver
plotter(ht(3:500, :), x, t(3:500))
simplified_solver
plotter(ht(3:500, :), x, t(3:500))
simplified_solver
plotter(ht(3:500, :), x, t(3:500))
simplified_solver
plotter(ht(3:500, :), x, t(3:500))
simplified_solver
plotter(ht(3:500, :), x, t(3:500))
plot(x, S(1,:), x, S(500,:))
plot(x, h(1, :), x, h(500,:))
simplified_solver
plot(x, S(1,:), x, S(500,:))
plot(x, h(1, :), x, h(500,:))
simplified_solver
plot(x, h(1, :), x, h(500,:))
plot(x, h(1, :), x, h(50,:))
plot(x, h(1, :), x, h(5,:))
simplified_solver
plot(x, h(1, :), x, h(50,:))
incising_explicit
plotter(h, x, t)
plot(x, S(1, :), x, S(100, :))
incising_explicit
plot(x, S(1, :), x, S(100, :))
incising_explicit
plot(x, S(1, :), x, S(100, :))
incising_explicit
plot(x, S(1, :), x, S(100, :))
plot(x, S(1, :), x, S(10, :))
plot(x, S(1, :), x, S(1000, :))
plotter(S, x, t)
incising_explicit
plotter(S, x, t)
incising_explicit
plotter(S, x, t)
incising_explicit
plotter(S, x, t)
incising_explicit
plotter(S, x, t)
incising_explicit
plotter(S, x, t)
incising_explicit
plotter(S, x, t)
incising_explicit
plotter(S, x, t)\
plotter(S, x, t)
plot(x, S(1,:), x, S(1000, :))
incising_explicit
```

```
plot(x, S(1,:), x, S(1000, :))
incising_explicit
plot(x, S(1,:), x, S(1000, :))
plot(x, S(1,:), x, S(10000, :))
incising_explicit
plot(x, S(1,:), x, S(600, :))
plot(x, S(1,:), x, S(200, :))
incising_explicit
plot(x, S(1,:), x, S(200, :))
incising_explicit
plot(x, S(1,:), x, S(200, :))
plot(x, S(1,:), x, S(1000, :))
plot(x, h(1,:), x, h(1000, :))
incising_explicit
plot(x, h(1,:), x, h(1000, :))
incising_explicit
plot(x, h(1,:), x, h(1000, :))
plot(x, h(1,:), x, h(10000, :))
plot(x, h(1,:), x, h(5000, :))
plot(x, h(1,:), x, h(2000, :))
plot(x, h(1,:), x, h(3000, :))
plot(x, h(1,:), x, h(4000, :))
incising_explicit
plot(x, h(1,:), x, h(2000, :))
plot(x, h(1,:), x, h(1000, :))
plot(x, h(1,:), x, h(1500, :))
incising_explicit
plot(x, h(1,:), x, h(2000, :))
plot(x, h(1,:), x, h(1000, :))
plot(x, h(1,:), x, h(500, :))
plot(x, h(1,:), x, h(200, :))
plot(x, h(1,:), x, h(100, :))
incising_explicit
plot(x, h(1,:), x, h(100, :))
incising_explicit
plot(x, h(1,:), x, h(100, :))
plot(x, h(1,:), x, h(1000, :))
plot(x, S(1,:), x, S(1000, :))
simplified_solver
plot(x, S(1,:), x, S(500, :))
simplified_solver
plot(x, h(1,:), x, h(20, :))
simplified_solver
plot(x, h(1,:), x, h(20, :))
plot(x, h(1,:), x, h(500, :))
plot(x, h(1,:), x, h(400, :))
plot(x, h(1,:), x, h(300, :))
plot(x, h(1,:), x, h(300, :), x, h(400,:), x, h(500, :))
plot(x, h(1,:), x, h(300, :), x, h(400,:), x, h(450, :))
plot(x, h(1,:), x, h(300, :), x, h(400,:), x, h(420, :))
plotter(ht(3:500, :), x, t(3:500))
```

```
plot(x, h(1,:), x, h(400, :))
plot(x, h(1,:), x, h(500, :))
plot(x, h(1,:), x, h(300, :), x, h(500, :))
title("h evolution for initial linear profile")
xlabel("x")
ylabel("h")
legend("t = 0", "t = 37 days", "t = 62 days")
h_Q-8 = h;
h_Q8 = h;
simplified_solver
plot(x, h(1,:), x, h(300, :), x, h(500, :))
simplified_solver
plot(x, h(1,:), x, h(300, :), x, h(500, :))
simplified_solver
plot(x, h(1,:), x, h(300, :), x, h(500, :))
plot(x, h(1,:), x, h(100, :), x, h(200, :))
plot(x, h(1,:), x, h(150, :), x, h(200, :))
plot(x, h(1,:), x, h(150, :), x, h(200, :), x, h(250,:))
plot(x, h(1,:), x, h(150, :), x, h(200, :))
plot(x(200:500), h(1,200:500), x(200:500), h(150, 200:500), x(200:500), h(200, 200:↙
500))
legend("t = 0", "t = 37 days", "t = 62 days")
legend("t = 0", "t = 19 days", "t = 25 days")
ylabel("h")
xlabel("x")
title("h evol for init linear, Q = 10^{-9}")
simplified_solver
plot(x(200:500), h(1,200:500), x(200:500), h(150, 200:500), x(200:500), h(200, 200:↙
500))
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(500, 200:↙
500))
simplified_solver
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(500, 200:↙
500))
simplified_solver
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(49-, 200:↙
500))
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(490, 200:↙
500))
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(400, 200:↙
500))
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(350, 200:↙
500))
simplified_solver
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(350, 200:↙
500))
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(450, 200:↙
500))
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(400, 200:↙
500))
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(400, 200:↙
```

```
500), x(200:500), h(500, 200:500))
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(350, 200:↙
500), x(200:500), h(500, 200:500))
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(450, 200:↙
500), x(200:500), h(500, 200:500))
legend("t = 0", "t = 37 days", "t = 56 days", "t = 62 days"_
legend("t = 0", "t = 37 days", "t = 56 days", "t = 62 days")
title("h evol for init linear, Q = 10^{-9}")
xlabel("x")
ylabel("h")
simplified_solver
dx/dt
plot(x, prop_speed - dx/dt(1,:))
plot(x, prop_speedht(1, :) = ht(2, :); - dx/dt)
plot(x, prop_speed(1, :) - dx/dt)
plot(x, prop_speed(500, :) - dx/dt)
max(prop_speed)
s_diff = prop_speed - dx/dt;
simplified_solver
s_diff = prop_speed - dx/dt;
plotter(prop_speed, x, t)
plotter(abs(prop_speed), x, t)
simplified_solver
plotter(abs(prop_speed), x, t)
s_diff = prop_speed - dx/dt;
simplified_solver
s_diff = prop_speed - dx/dt;
simplified_solver
s_diff = prop_speed - dx/dt;
simplified_solver
s_diff = prop_speed - dx/dt;
simplified_solver
s_diff = prop_speed - dx/dt;
simplified_solver
s_diff = prop_speed - dx/dt;
simplified_solver
s_diff = prop_speed - dx/dt;
simplified_solver
s_diff = prop_speed - dx/dt;
simplified_solver
s_diff = prop_speed - dx/dt;
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(450, 200:↙
500), x(200:500), h(500, 200:500))
simplified_solver
plot(x(200:500), h(1,200:500), x(200:500), h(100, 200:500), x(200:500), h(150, 200:↙
500), x(200:500), h(200, 200:500))
plot(x(200:500), h(1,200:500), x(200:500), h(100, 200:500), x(200:500), h(150, 200:↙
500), x(200:500), h(200, 220:500))
plot(x(200:500), h(1,200:500), x(200:500), h(100, 200:500), x(200:500), h(150, 200:↙
```

```
500), x(200:500), h(220, 200:500))
simplified_solver
plot(x(200:500), h(1,200:500), x(200:500), h(100, 200:500), x(200:500), h(150, 200: ↵
500), x(200:500), h(220, 200:500))
plotter(h, x, t)
plot(x(200:500), h(1,200:500), x(200:500), h(300, 200:500), x(200:500), h(450, 200: ↵
500), x(200:500), h(500, 200:500))
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(300, :), x, h(400, :), x, h(500, :))
title("h evol for init linear, Q = 10^{-10}")
xlabel("x")
ylabel("h")
legend("t = 0", "t = 12.5 days", "t = 37 days", "t = 50 days", "t = 62 days")
simplified_solver
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(300, :), x, h(350, :), x, h(390, :))
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(201, :), x, h(202, :), x, h(203, :))
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(201, :), x, h(202, :), x, h(205, :))
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(300, :), x, h(350, :), x, h(390, :))
s_diff = prop_speed - dx/dt;
plot(x, s_diff(1,:), x, s_diff(100, :), x, s_diff(200,:), x, s_diff(300,:), x, s_diff ↵
(350,:), x, s_diff(390,:))
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(300, :), x, h(350, :), x, h(390, :))
simplified_solver
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(300, :), x, h(350, :), x, h(390, :))
s_diff = prop_speed - dx/dt;
plot(x, s_diff(1,:), x, s_diff(100, :), x, s_diff(200,:), x, s_diff(300,:), x, s_diff ↵
(350,:), x, s_diff(390,:))
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(300, :), x, h(400, :))
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(300, :), x, h(350, :), x, h(390, :))
simplified_solver
plot(x, h(1, :), x, h(100, :), x, h(200, :), x, h(300, :), x, h(350, :), x, h(390, :))
plot(x, h(1, :), x, h(300, :), x, h(400, :), x, h(450, :), x, h(470, :), x, h(500, :))
plot(x, h(300, :), x, h(350, :), x, h(400, :), x, h(450, :), x, h(470, :), x, h(500, ↵
:))
s_diff = prop_speed - dx/dt;
plot(x, s_diff(1,:), x, s_diff(100, :), x, s_diff(200,:), x, s_diff(300,:), x, s_diff ↵
(350,:), x, s_diff(390,:))
plot(x, s_diff(1,:), x, s_diff(10, :), x, s_diff(20,:), x, s_diff(30,:), x, s_diff ↵
(35,:), x, s_diff(39,:))
plot(x, s_diff(1,:), x, s_diff(10, :))
simplified_solver
plot(x, h(1, :), x, h(100, :), x, h(200, :))
simplified_solver
plot(x, h(1, :), x, h(100, :), x, h(200, :))
plot(x, h(1, :), x, h(10, :), x, h(20, :))
plot(x, h(1, :), x, h(10, :), x, h(15, :))
plot(x, h(1, :), x, h(10, :), x, h(12, :))
s_diff = prop_speed - dx/dt;
plot(x, s_diff(1, :), x, s_diff(10, :), x, s_diff(12, :))
plot(x, s_diff(1, :), x, s_diff(10, :))
simplified_solver
plot(x, h(1, :), x, h(10, :), x, h(15, :))
```

```
plot(x, h(1, :), x, h(2, :), x, h(5, :))
simplified_solver
plot(x, h(1, :), x, h(2, :), x, h(5, :))
plot(x, h(1, :), x, h(2, :), x, h(100, :))
plot(x, h(1, :), x, h(2, :), x, h(10, :))
plot(x, S(1, :), x, S(10, :), x, S(100, :))
plot(x, S(1, :), x, S(10, :), x, S(20, :))
plot(x, S(1, :), x, S(10, :), x, S(15, :))
simplified_solver
plot(x, S(1, :), x, S(10, :), x, S(15, :))
plot(x, S(1, :), x, S(10, :), x, S(100, :))
plot(x, S(1, :), x, S(10, :), x, S(500, :))
plot(x, h(1, :), x, h(2, :), x, h(100, :))
plot(x, h(1, :), x, h(100, :), x, h(200, :))
plot(x, h(1, :), x, h(100, :), x, h(300, :))
plot(x, S(1, :), x, S(10, :), x, S(500, :))
plot(x, S(1, :), x, S(10, :), x, S(300, :))
plot(x, S(1, :), x, S(10, :), x, S(200, :))
plot(x, S(1, :), x, S(100, :), x, S(150,:), x, S(200, :))
xlabel("x")
ylabel("S")
title("h_x for initial tanh profile")
ylabel("h_x")
legend("t = 0", "t = 12.5 days", "t = 25 days")
plot(x, h(1, :), x, h(100, :), x, h(150,:), x, h(200, :))
plotter(h, x, t)
simplified_solver
plot(x, h(1, :), x, h(100, :), x, h(150,:), x, h(200, :))
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plot(x, h(500, :))
plot(x, S(500, :))
plot(x, S(400, :), x,(500, :))
plot(x, S(400, :), x,S(500, :))
plot(x, S(300,:), x, S(400, :), x,S(500, :))
plot(x, S(100,:), x, S(200,:),x, S(300,:), x, S(400, :), x,S(500, :))
legend("t = 12.5 days", "t = 25 days", "t = 37.5 days", "t = 50 days", "t = 62 days" )
xlabel("x")
ylabel("h_x")
title("h_x for initial tanh profile")
title("h_x for initial tanh profile, Q = 10^{-3}, h_x ~ 10^{-6}")
plot(x, h(100,:), x, h(200,:),x, h(300,:), x, h(400, :), x,h(500, :))
title("h for initial tanh profile, Q = 10^{-3}, h_x ~ 10^{-6}")
ylabel("h")
xlabel("x")
legend("t = 12.5 days", "t = 25 days", "t = 37.5 days", "t = 50 days", "t = 62 days" )
s_diff = prop_speed - dx/dt;
plot(x, s_diff(1, :), x, s_diff(10, :))
plot(x, s_diff(1, :), x, s_diff(500, :))
plot(x, s_diff(1, :), x, s_diff(100,:), x, s_diff(200,:), x, s_diff(300, :))
```

```
simplified_solver
plot(x, h(100,:), x, h(200,:),x, h(300,:), x, h(400, :), x,h(500, :))
plot(x, h(1, :), x, h(100,:), x, h(200,:),x, h(300,:), x, h(400, :), x,h(500, :))
simplified_solver
plot(x, h(1, :), x, h(100,:), x, h(200,:),x, h(300,:), x, h(400, :), x,h(500, :))
plot(x, h(1, :), x, h(100,:), x, h(300,:),x, h(1000,:), x, h(2500, :), x,h(5000, :))
plotter(h, x, t)
simplified_solver
plot(x, h(1, :), x, h(100,:), x, h(300,:),x, h(1000,:), x, h(2500, :), x,h(5000, :))
simplified_solver
plot(x, h(1, :), x, h(100,:), x, h(300,:),x, h(1000,:), x, h(2500, :), x,h(5000, :))
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :), x,S(5000, :))
simplified_solver
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :), x,S(5000, :))
plot(x, h(1, :), x, h(100,:), x, h(300,:),x, h(1000,:), x, h(2500, :), x,h(5000, :))
plot(x, ht(1, :), x, ht(100,:), x, ht(300,:),x, ht(1000,:), x, ht(2500, :), x,ht(5000, ↵
:))
plot(x, ht(100,:), x, ht(300,:),x, ht(1000,:), x, ht(2500, :), x,ht(5000, :))
simplified_solver
plot(x, ht(100,:), x, ht(300,:),x, ht(1000,:), x, ht(2500, :), x,ht(5000, :))
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :), x,S(5000, :))
plot(x, h(1, :), x, h(100,:), x, h(300,:),x, h(1000,:), x, h(2500, :), x,h(5000, :))
simplified_solver
plot(x, h(1, :), x, h(100,:), x, h(300,:),x, h(1000,:), x, h(2500, :), x,h(5000, :))
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :), x,S(5000, :))
simplified_solver
plot(x, h(1, :), x, h(100,:), x, h(300,:),x, h(1000,:), x, h(2500, :), x,h(5000, :))
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :), x,S(5000, :))
plot(x, h(1, :), x, h(100,:), x, h(300,:),x, h(1000,:), x, h(2500, :))
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :))
simplified_solver
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :))
simplified_solver
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :))
plot(x, St(1, :), x, St(100,:), x, St(300,:),x, St(1000,:), x, St(2500, :))
simplified_solver
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :))
plot(x, St(1, :), x, St(100,:), x, St(300,:),x, St(1000,:), x, St(2500, :))
plot(x, h(1, :), x, h(100,:), x, h(300,:),x, h(1000,:), x, h(2500, :))
simplified_solver
plot(x, h(1, :), x, h(100,:), x, h(300,:),x, h(1000,:), x, h(2500, :))
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :))
simplified_solver
plot(x, h(1, :), x, h(100,:), x, h(300,:),x, h(1000,:), x, h(2500, :))
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :))
simplified_solver
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :))
simplified_solver
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :))
simplified_solver
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :))
```

```
simplified_solver
plot(x, S(1, :), x, S(100,:), x, S(300,:),x, S(1000,:), x, S(2500, :))
simplified_solver
plot(x, S(1, :), x, S(100,:), x, S(200,:),x, S(4000,:), x, S(500, :))
plot(x, S(1, :), x, S(100,:), x, S(200,:),x, S(400,:), x, S(500, :))
max(S(1,:))
simplified_solver
plot(x, h(1, :), x, h(3, :))
plot(t, v_rec)
plot(y_intersect, v_rec)
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(t, LHm)
plot(LHm(1:1240), v_recL(1:1240))
plot(LHm(1:364), v_recL(1:364))
plot(t(1:364), v_recL(1:364))
plot(y_intersect, v_rec)
plot(y_intersect(2:364), v_rec(2:364))
plot(t, y_intersect)
plot(t(2:364), y_intersect(2,364))
plot(t(2:364), y_intersect(2:364))
plot(t(2:364), y_intersect(2:364), LHm(2:364))
plot(t(2:364), y_intersect(2:364), t(2, 364), LHm(2:364))
plot(t(2:364), y_intersect(2:364), t(2:364), LHm(2:364))
title("points where h_x = max(h_x(t=0))")
xlabel("t")
ylabel("x")
legend("right hand points", "left hand points")
title("points where h_x = max(h_x(t=0)), Q = 10^{-3}")
plot(t(1:364), v_recL(1:364))
simplified_solver
plot(t(1:364), v_recL(1:364))
simplified_solver
plot(t(1:364), v_recL(1:364))
simplified_solver
plot(t(1:364), v_recL(1:364))
plot(t(1:50), v_recL(1:50))
plot(t, y_intersect)
simplified_solver
plot(t(1:50), v_recL(1:50))
simplified_solver
plot(t(1:50), v_recL(1:50))
simplified_solver
plot(t(1:50), v_recL(1:50))
plot(t(1:364), v_recL(1:364))
plot(t(1:364), v_recL(1:364),t(1:364), v_rec(1:364) )
title("receding rate of points where h_x = max(h_x(t=0)), Q = 10^{-3}")
xlabel("t")
ylabel("\dot x")
```

```
ylabel("v_{receding}")
plot(t(1:364), v_rec(1:364),t(1:364), v_recL(1:364) )
ylabel("v_{receding}")
xlabel("t")
title("receding rate of points where h_x = max(h_x(t=0)), Q = 10^{-3}")
legend("right hand points", "left hand points")
plot(y_intersect(1:364), v_rec(1:364),LHm(1:364), v_recL(1:364) )
plot(y_intersect(2:364), v_rec(2:364),LHm(2:364), v_recL(2:364) )
title("receding rate of points where h_x = max(h_x(t=0)), Q = 10^{-3}")
legend("right hand points", "left hand points")
xlabel("x")
ylabel("v_{receding}")
plot(S(1:364,:), v_rec(1:364),S(1:364,:), v_recL(1:364) )
simplified_solver
plot(ht_r(2:364), v_rec(2:364),ht_l(2:364), v_recL(2:364) )
plot(ht_l(2:364), v_recL(2:364) )
plot(ht_r(2:364), v_rec(2:364))
plot(St_r(2:364), v_rec(2:364),St_l(2:364), v_recL(2:364) )
plot(t(2:364), ht_r(2:364))
plot(t(2:364), h(:,2:364))
plot(t(2:364), h(2:364,:))
plot(x(2:364), h(2:364,:))
plot(t, h(364,:))
plot(x, h(364,:))
plot(t(2:364), ht_r(2:364))
plot(t(2:364), ht(1000, 2:364))
plot(t(2:364), ht(2:364, 1000))
plot(t(2:364), h(2:364, 1000))
plot(St_r(2:100), v_rec(2:100),St_l(2:100), v_recL(2:100) )
plot(ht_r(2:100), v_rec(2:100),ht_l(2:100), v_recL(2:100) )
plot(ht_l(2:100), v_recL(2:100) )
xlabel("h_t")
ylabel("v_{rec}")
title("receding rate where h_x = max(h_x(t=0)), Q = 10^{-3}")
title("LHS v_{rec} vs h_t where h_x = max(h_x(t=0)), Q = 10^{-3}")
plot(ht_r(2:100), v_rec(2:100) )
title("RHS v_{rec} vs h_t where h_x = max(h_x(t=0)), Q = 10^{-3}")
ylabel("v_{rec}")
xlabel("h_t")
plot(St_l(2:100), v_recL(2:100) )
plot(St_r(2:100), v_recL(2:100) )
simplified_solver
plotter(h, x, t)
plot(t, v_rec)
plot(t, y_intersect)
plot(x, S(500,:))
plot(x, S(1, :), x, S(500, :))
simplified_solver
plot(x, S(1, :), x, S(500, :))
plot(t, y_intersect)
simplified_solver
```

```matlab
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
max(S(1,:))
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
plot(t, v_rec)
plot(t, y_intersect)
title("points where h_x = max(h_x(t=0))")
title("points where h_x = max(h_x(t=0)) for init quadratic")
xlabel("t")
ylabel("x")
simplified_solver
plot(t, v_rec)
plot(y_intercept, v_rec)
plot(y_intersect, v_rec)
simplified_solver
plot(y_intersect, v_rec)
plot(t, v_rec)
plot(t, y_intersect)
plot(x, h(1, :), x, h(50, :))
plot(x, S(1, :), x, S(50, :))
simplified_solver
plot(x, S(1, :), x, S(50, :))
plot(x, S(1, :), x, S(100, :))
plot(t, y_intersect)
plot(y_intersect, v_rec)
simplified_solver
plot(y_intersect, v_rec)
simplified_solver
plot(y_intersect, v_rec)
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)\
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
plot(y_intersect, v_rec)
```

```
simplified_solver
plot(t, y_intersect)
plot(y_intersect, v_rec)
plot(t(2:nt), y_intersect(2:nt))
plot(y_intersect(2:nt), v_rec(2:nt))
plot(y_intersect(2:800), v_rec(2:800))
plot(t(2:nt), v_rec(2:nt))
plot(t(5:nt), v_rec(5:nt))
simplified_solver
plot(t, y_intersect)
plot(t(5:nt), y_intersect(5,nt))
plot(t(5:nt), y_intersect(5:nt))
plot(y_intersect(5:nt), v_rec(5:nt))
simplified_solver
plot(y_intersect(5:nt), v_rec(5:nt))
simplified_solver
plot(y_intersect(5:nt), v_rec(5:nt))
plot(y_intersect(5:100), v_rec(5:100))
simplified_solver
plot(y_intersect(5:nt), v_rec(5:nt))
plot(t(5:nt), v_rec(5:nt))
plot(t(5:588), v_rec(5:588))
simplified_solver
plot(t(5:588), v_rec(5:588))
plot(t(5:58), v_rec(5:58))
simplified_solver\
simplified_solver
plot(t(5:58), v_rec(5:58))
plot(t(5:588), v_rec(5:588))
plot(t(5:580), v_rec(5:580))
simplified_solver
plot(t(5:58), v_rec(5:58))
simplified_solver
plot(t(5:58), v_rec(5:58))
simplified_solver
plot(t(5:58), v_rec(5:58))
plot(t(5:58), y_intersect(5:58))
simplified_solver
plot(t(5:588), v_rec(5:588))
plot(t(2:588), v_rec(2:588))
plot(t(2:1000), v_rec(2:1000))
plot(y_intersect(2:588), v_rec(2:588))
simplified_solver
plot(t(5:588), v_rec(5:588))
plot(t(2:244), v_rec(2:244))
simplified_solver
plot(t(2:3000), v_rec(2:3000))
plot(t(2:500), v_rec(2:500))
plot(t(2:300), v_rec(2:300))
simplified_solver
plot(t(2:3000), v_rec(2:3000))
```

```
plot(t(2:1000), v_rec(2:1000))
plot(t(2:500), v_rec(2:500))
plot(t(2:200), v_rec(2:200))
plot(t(2:3000), y_intersect(2:3000))
plot(t(2:nt), y_intersect(2:nt))
plot(t(2:nt), LHm
plot(t(2:nt), LHm(2:nt))
plot(x, S(1,:), x, S(100, :))
plot(x, S(1,:), x, S(100, :), x, S(200,:))
simplified_solver
plot(x, S(1,:), x, S(100, :), x, S(200,:))
plot(x, S(1,:), x, S(100, :), x, S(200,:), x, S(500,:))
plot(t(2:nt), LHm(2:nt))
plot(t(2:500), LHm(2:500))
plot(t(2:300), LHm(2:300))
plot(t(2:350), LHm(2:350))
plot(t(2:350), y_intersect(2:350))
plot(t(2:350), v_rec(2:350))
plot(y_intersect(2:350), v_rec(2:350))
simplified_solver
plot(y_intersect(2:350), v_rec(2:350))
plot(y_intersect(2:35), v_rec(2:35))
simplified_solver
plot(y_intersect(2:700), v_rec(2:700))
plot(y_intersect(1:700), v_rec(1:700))
simplified_solver
plot(y_intersect(1:700), v_rec(1:700))
plot(y_intersect(1:200), v_rec(1:200))
simplified_solver
plot(y_intersect(1:200), v_rec(1:200))
plot(y_intersect(2:200), v_rec(2:200))
plot(y_intersect(2:200), v_rec(2:200), LHm(2:200), v_recL(2:200))
plot(y_intersect(2:200), v_rec(2:200), LHm(2:200), -v_recL(2:200))
plot(y_intersect(2:200), v_rec(2:200), 0.5 - LHm(2:200), -v_recL(2:200))
plot(y_intersect(2:200), v_rec(2:200), 0.5 + LHm(2:200), -v_recL(2:200))
plot(y_intersect(2:200), v_rec(2:200), 0.5 - LHm(2:200), -v_recL(2:200))
plot(y_intersect(2:200), v_rec(2:200), -0.5 - LHm(2:200), -v_recL(2:200))
plot(y_intersect(2:200), v_rec(2:200), 1.5 - LHm(2:200), -v_recL(2:200))
plot(y_intersect(2:200), v_rec(2:200), 1 - LHm(2:200), -v_recL(2:200))
simplified_solver
plot(y_intersect(2:200), v_rec(2:200), 1 - LHm(2:200), -v_recL(2:200))
title("v_{rec} plotted against x for tanh Q = 10^{-3}")
legend("right hand side", "left hand side")
xlabel("t")
xlabel("x")
ylabel("v_{rec}")
simplified_solver
plot(y_intersect(2:200), v_rec(2:200), 1 - LHm(2:200), -v_recL(2:200))
ylabel("v_{rec}")
xlabel("x")
legend("right hand side", "left hand side")
```

```
title("v_{rec} plotted against x for tanh Q = 10^{-3}")
plot(t(2:200), y_intersect(2:200),t(2:200), -LHm(2:200))
plot(t(2:200), y_intersect(2:200),t(2:200),0.5 -LHm(2:200))
plot(t(2:200), y_intersect(2:200),t(2:200), 1-LHm(2:200))
title("x_{rec} plotted against t for tanh Q = 10^{-3}")
legend("right hand side", "left hand side")
ylabel("x_{rec}")
xlabel("x")
xlabel("xt")
xlabel("t")
plot(x, h(1,:), x, h(100,:), x, h(200, :), x, h(300,:), x, h(400,:))
plot(x, h(1,:), x, h(100,:), x, h(200, :), x, h(300,:), x, h(400,:), x, h(500,:))
plot(x, S(1,:), x,S(100,:), x, S(200, :), x, S(300,:), x, S(400,:), x, S(500,:))
plot(x, S(300,:), x,S(350,:), x, S(400, :), x, S(420,:), x, S(450,:), x, S(500,:))
plot(y_intersect(2:200), v_rec(2:200))
plot(St_r(2:200), v_rec(2:200))
plot(St_r(5:200), v_rec(5:200))
plot(t(2:200), St(2:200))
plot(t(2:200), St_r(2:200))
plot(t(2:100), St_r(2:100))
plot(t(2:150), St_r(2:150))
plot(t(2:110), St_r(2:110))
plot(t(2:115), St_r(2:115))
plot(t(2:112), St_r(2:112))
plot(St_r(2:112), v_rec(2:112))
plot(St_r(2:112), v_rec(2:112), LHm(2:112), v_recL(2:112))
plot(St_r(2:112), v_rec(2:112), 1-LHm(2:112), -v_recL(2:112))
plot(St_r(2:112), v_rec(2:112), 0.5-LHm(2:112), -v_recL(2:112))
plot(St_r(2:112), v_rec(2:112), St_l(2:112), v_recL(2:112))
plot(St_r(2:112), v_rec(2:112), St_l(2:112), -v_recL(2:112))
xlabel("t"S_t
xlabel("S_t")
ylabel("v_{rec}")
legend("right hand side", "left hand side")
title("v_{rec} plotted against St for tanh Q = 10^{-3}")
plot(ht_r(2:112), v_rec(2:112), ht_l(2:112), -v_recL(2:112))
plot(ht_r(2:112), v_rec(2:112), ht_l(2:112), v_recL(2:112))
plot(ht_r(2:112), v_rec(2:112))
plot(ht_l(2:112), v_recL(2:112))
plot(ht_r(2:112), v_rec(2:112), ht_l(2:112), v_recL(2:112))
plot(ht_r(2:50), v_rec(2:50), ht_l(2:112), v_recL(2:112))
plot(ht_r(2:40), v_rec(2:40), ht_l(2:112), -v_recL(2:112))
plot(ht_r(2:40), v_rec(2:40), 1- ht_l(2:112), -v_recL(2:112))
plot(ht_r(2:40), v_rec(2:40), 1e-5- ht_l(2:112), -v_recL(2:112))
plot(ht_r(2:40), v_rec(2:40), 1e-7- ht_l(2:112), -v_recL(2:112))
plot(ht_r(2:40), v_rec(2:40), 1e-8- ht_l(2:112), -v_recL(2:112))
plot(ht_r(2:40), v_rec(2:40), 2e-8- ht_l(2:112), -v_recL(2:112))
title("v_{rec} plotted against ht for tanh Q = 10^{-3}")
legend("right hand side", "left hand side")
xlabel("h_t")
ylabel("v_{rec}")
```

```
plot(St_r(2:112), v_rec(2:112), St_l(2:112), -v_recL(2:112))
plot(St_r(2:40), v_rec(2:40), St_l(2:112), -v_recL(2:112))
simplified_solver
plot(x, h(1,:), x, h(100,:), x, h(200, :), x, h(300,:), x, h(400,:), x, h(500,:))
plot(t, y_intersect)
plot(t(2:100), y_intersect(2:100))
plot(t(2:50), y_intersect(2:100))
plot(t(2:50), y_intersect(2:50))
plot(t(2:47), y_intersect(2:47))
plot(t(2:45), y_intersect(2:45))
plot(t(2:45), v_rec(2:45))
plot(y_intersect(2:45), v_rec(2:45))
plot(y_intersect(2:nt), v_rec(2:nt))
plot(y_intersect(2:300), v_rec(2:300))
plot(y_intersect(5:nt), v_rec(5:nt))
plot(t(5:nt), y_intersect(5:nt))
simplified_solver
plot(t(5:nt), y_intersect(5:nt))
plot(y_intersect(5:nt), v_rec(5:nt))
simplified_solver
plot(t(5:nt), y_intersect(5:nt))
simplified_solver
plot(t(5:nt), y_intersect(5:nt))
simplified_solver
plot(t(5:nt), y_intersect(5:nt))
simplified_solver
plot(t(5:nt), y_intersect(5:nt))
simplified_solver
plot(t(5:nt), y_intersect(5:nt))
plot(y_intersect(5:nt), v_rec(5:nt))
simplified_solver
plot(y_intersect(5:nt), v_rec(5:nt))
simplified_solver
plot(x, S(1, :), x, S(1000,:), x, S(2000,:), x, S(3000,:), x, S(4000,:), x, S(5000,:))
simplified_solver
plot(y_intersect(5:nt), v_rec(5:nt))
simplified_solver
plot(y_intersect(5:nt), v_rec(5:nt))
simplified_solver
plot(y_intersect(5:nt), v_rec(5:nt))
plot(t(5:nt), y_intersect(5:nt))
simplified_solver
plot(y_intersect(5:nt), v_rec(5:nt))
load hanh1
load hahn1
load tanh_Q10-3_hx10-6_wksp
curveFitter
%-- 2023-07-12 11:05 AM --%
cd C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB
ld
cd
```

```
cd "C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB"
ld "C:\Users\maggi\Documents\School Stuff\ESROP\Code\SupraglacialStreams\MATLAB"
load tanh_Q10-3_hx10-6_wksp
curvefitter
curveFitter
plot(ht_r, v_rec)
plot(ht_r(2:200), v_rec(2:200))
plot(ht_r(2:40), v_rec(2:40))
fit_ht_r = ht_r(2:40);
fit_v_rec_r = v_rec(2:40);
curveFitter
fit_ht_l = ht_l(2:40);
fit_v_rec_l = ht_l(2:40);
fit_v_rec_l = v_rec_l(2:40);
fit_v_rec_l = v_recL(2:40);
simplified_solver
cd 'C:\Users\maggi\Documents\School ↙
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\Simplified_Balance'
simplified_solver
plot(ht_r(2:40), v_rec(2:40))
plot(t(2:100), y_intercept(2:100))
plot(t(2:100), y_intersect(2:100))
simplified_solver
plot(t(2:100), y_intersect(2:100))
simplified_solver
plot(t(2:100), y_intersect(2:100))
plot(t(2:100), y_intersect(2:121))
plot(t(2:121), y_intersect(2:121))
plot(t(2:500), y_intersect(2:500))
plot(t(2:1000), y_intersect(2:1000))
plot(t, y_intersect)
plot(t, v_rec)
curveFitter
plot(y_intersect, v_rec)
plot(ht_r, y_intersect)
plot(ht_r(2:100), y_intersect(2:100))
plot(ht_r(2:50), y_intersect(2:50))
plot(ht_r(2:20), y_intersect(2:20))
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
plot(x, h(1, :), x, h(1000,:))
simplified_solver
plot(x, h(1, :), x, h(1000,:))
plot(t, y_intersect)
simplified_solver
plot(x, h(1, :), x, h(1000,:))
plot(t, y_intersect)
plot(x, h(1, :), x, h(800,:))
```

```
plot(t, y_intersect)
plot(t(2:800), y_intersect(2:800))
plot_t = t(2:800);
plot_x = y_intersect(2:800);
curveFitter
plot(x, h(1, :), x, h(800,:))
plot(x, h(1, :), x, h(750,:), x, h(800,:))
plot(x, h(1, :), x, h(650,:), x, h(750,:), x, h(800,:), x, h(850,:))
simplified_solver
plot(x, h(1, :), x, h(650,:), x, h(750,:), x, h(800,:), x, h(850,:))
simplified_solver
plot(x, h(1, :), x, h(650,:), x, h(750,:), x, h(800,:), x, h(850,:))
plot(t, y_intersect)
simplified_solver
plot(x, h(1, :), x, h(650,:), x, h(750,:), x, h(800,:), x, h(850,:))
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(t, y_intersect)
simplified_solver
plot(x, h(1, :), x, h(100,:), x, h(400, :), x, h(800,:))
simplified_solver
plot(x, h(1,:))
simplified_solver
plot(x, h(1,:))
simplified_solver
plot(x, h(1, :), x, h(100,:), x, h(400, :), x, h(800,:))
plot(t, y_intersect)
plot(t(2:400), y_intersect(2:400))
t_plot=t(2:400);
x_plot = y_intersect(2:400);
curveFitter
simplified_solver
plot(t, y_intersect)
plot(t(2:400), y_intersect(2:400))
t_plot=t(2:400);
x_plot = y_intersect(2:400);
curveFitter
simplified_solver
t_plot=t(2:400);
x_plot = y_intersect(2:400);
curveFitter
simplified_solver
plot(t, y_intersect)
plot(t(2:400), y_intersect(2:400))
t_plot=t(2:400);
```

```
x_plot = y_intersect(2:400);
curveFitter
simplified_solver
plot(t(2:400), y_intersect(2:400))
plot(t(2:380), y_intersect(2:380))
plot(t(2:370), y_intersect(2:370))
plot(t(2:360), y_intersect(2:360))
t_plot=t(2:360);
x_plot = y_intersect(2:360);
curveFitter
simplified_solver
plot(t(2:360), y_intersect(2:360))
plot(t(2:320), y_intersect(2:320))
plot(t(2:340), y_intersect(2:340))
x_plot = y_intersect(2:340);
t_plot=t(2:340);
curveFitter
simplified_solver
plot(t(2:340), y_intersect(2:340))
plot(t(2:340), y_intersect(2:360))
plot(t(2:360), y_intersect(2:360))
plot(t(2:380), y_intersect(2:380))
plot(t, y_intersect)
plot(x, S(1, :), x, S(1000,:))
plot(t, y_intersect)
plot(x, S(1, :), x, S(1000,:))
plotter(S, x, t)
simplified_solver
plotter(S, x, t)
simplified_solver
plotter(S, x, t)
plot(t, y_intersect)
plot(t(2:60), y_intersect(2:60))
plot(t(2:70), y_intersect(2:70))
plot(t(2:75), y_intersect(2:75))
plot(t(2:80), y_intersect(2:80))
plot(t(2:78), y_intersect(2:78))
simplified_solver
plot(t(2:78), y_intersect(2:78))
plot(t(2:76), y_intersect(2:76))
plot(t(2:75), y_intersect(2:75))
t_plot=t(2:75);
x_plot=x(2:75);
curveFitter
x_plot=y_intersect(2:75);
simplified_solver
plot(t(2:75), y_intersect(2:75))
x_plot=y_intersect(2:75);
t_plot=t(2:75);
curveFitter
plot(t(2:75), y_intersect(2:75))
```

```
plotter(S, x, t)
simplified_solver
plotter(S, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
simplified_solver
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plot(t(2:75), y_intersect(2:75))
plot(x, S(2, :))
plot(x, S(1, :), x, S(2, :))
plot(x, S(1, :), x, S(2, :), x, S(3, :))
plot(x, S(1, :), x, S(2, :), x, S(3, :), x, S(4, :))
plot(x, S(1, :), x, S(5, :), x, S(10, :), x, S(20, :))
plot(x, S(1, :), x, S(25, :), x, S(50, :), x, S(100, :))
simplified_solver
plot(x, S(1, :), x, S(25, :), x, S(50, :), x, S(100, :))
plot(t(2:75), y_intersect(2:75))
plot(t, y_intersect)
plot(t(2:90), y_intersect(2:90))
t_plot=t(2:90);
plot(y_intersect(2:90), v_rec(2:90))
simplified_solver
plot(y_intersect(2:90), v_rec(2:90))
plot(y_intersect, v_rec)
plot(t, v_rec)
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plot(y_intersect, v_rec)
plot(LHm, v_recL)
plot(t,LHm)
plot(t(2:40),LHm(2:40))
plot(t(1:100),LHm(1:100))
plot(t(1:200),LHm(1:200))
plot(t(1:100),LHm(1:100))
plot(t(1:121),LHm(1:121))
plot(t(1:115),LHm(1:115))
plot(t(1:112),LHm(1:112))
plot(t(1:107),LHm(1:107))
plot(t(1:102),LHm(1:102))
plot(LHm(1:102),v_recL(1:102))
plot(y_intersect, v_rec)
plot(y_intersect(2, nt), v_rec(2:nt))
plot(y_intersect(2:nt), v_rec(2:nt))
x_plot = y_intersect(2:nt)
v_plot = v_rec(2:nt);
```

```
curveFitter
simplified_solver
plot(y_intersect(2:nt), v_rec(2:nt))
plot(y_intersect(2:400), v_rec(2:400))
plot(t, y_intersect)
plot(y_intersect(2:200), v_rec(2:200))
plot(y_intersect(5:200), v_rec(5:200))
plot(y_intersect(5:250), v_rec(5:250))
plot(y_intersect(5:300), v_rec(5:300))
plot(y_intersect(5:350), v_rec(5:350))
plot(y_intersect(5:320), v_rec(5:320))
plot(y_intersect(5:300), v_rec(5:300))
x_plot = y_intersect(5:300)
v_plot = v_rec(5:300)
curveFitter
simplified_solver
plot(y_intersect(5:300), v_rec(5:300))
plot(y_intersect(5:350), v_rec(5:350))
x_plot = y_intersect(5:300);
v_plot = v_rec(5:300);
curveFitter
simplified_solver
plot(y_intersect(5:350), v_rec(5:350))
plot(y_intersect(5:300), v_rec(5:300))
plot(y_intersect(5:320), v_rec(5:320))
plot(y_intersect(5:310), v_rec(5:310))
v_plot = v_rec(5:310);
x_plot = y_intersect(5:310);
curveFitter
simplified_solver
plot(y_intersect(5:310), v_rec(5:310))
x_plot = y_intersect(5:350);
plot(y_intersect(5:350), v_rec(5:350))
plot(y_intersect(5:320), v_rec(5:320))
plot(y_intersect(5:325), v_rec(5:325))
plot(y_intersect(5:330), v_rec(5:330))
x_plot = y_intersect(5:325);
v_plot = v_rec(5:325);
curveFitter
simplified_solver\
simplified_solver
plot(y_intersect(5:330), v_rec(5:330))
plot(y_intersect(5:340), v_rec(5:340))
plot(y_intersect(5:350), v_rec(5:350))
v_plot = v_rec(5:340);
x_plot = y_intersect(5:340);
curveFitter
simplified_solver
plotter(h, x, t)
plot(y_intersect(5:350), v_rec(5:350))
plot(y_intersect(5:360), v_rec(5:360))
```

```
plot(y_intersect(5:355), v_rec(5:355))
x_plot = y_intersect(5:350);
v_plot = v_rec(5:350);
curveFitter
simplified_solver
plot(y_intersect(5:365), v_rec(5:365))
v_plot = v_rec(5:365);
x_plot = y_intersect(5:365);
curveFitter
simplified_solver
cd 'C:\Users\maggi\Documents\School ↙
Stuff\ESROP\Code\SupraglacialStreams\MATLAB\Simplified_Balance'
simplified_solver
plot(y_intersect(5:375), v_rec(5:375))
plot(y_intersect(2:375), v_rec(2:375))
plot(y_intersect(2:380), v_rec(2:380))
plot(y_intersect(2:385), v_rec(2:385))
x_plot = y_intersect(5:385);
v_plot = v_rec(5:385);
curveFitter
simplified_solver
plot(y_intersect(2:385), v_rec(2:385))
v_plot = v_rec(5:385);
x_plot = y_intersect(5:385);
curveFitter
simplified_solver
plot(y_intersect(2:385), v_rec(2:385))
plot(y_intersect(2:375), v_rec(2:375))
plot(y_intersect(2:365), v_rec(2:365))
plot(y_intersect(2:355), v_rec(2:355))
plot(y_intersect(2:320), v_rec(2:320))
plot(y_intersect(2:300), v_rec(2:300))
plot(y_intersect(2:310), v_rec(2:310))
plot(y_intersect(2:305), v_rec(2:305))
x_plot = y_intersect(5:305);
v_plot = v_rec(5:305);
curveFitter
simplified_solver
plot(y_intersect(2:305), v_rec(2:305))
plot(y_intersect(2:285), v_rec(2:285))
plot(y_intersect(2:290), v_rec(2:290))
v_plot = v_rec(5:290);
x_plot = y_intersect(5:290);
curveFitter
simplified_solver
plot(y_intersect(2:290), v_rec(2:290))
plot(y_intersect(2:300), v_rec(2:300))
x_plot = y_intersect(5:300);
v_plot = v_rec(5:300);
curveFitter
simplified_solver
```

```
plot(y_intersect(2:300), v_rec(2:300))
plot(y_intersect(2:350), v_rec(2:350))
plot(y_intersect(2:320), v_rec(2:320))
v_plot = v_rec(5:320);
x_plot = y_intersect(5:320);
curveFitter
simplified_solver
plotter(h, x, t)
plot(y_intersect(2:320), v_rec(2:320))
simplified_solver
plot(y_intersect(2:320), v_rec(2:320))
plot(y_intersect(2:100), v_rec(2:100))
x_plot = y_intersect(2:100);
v_plot = v_rec(2:100);
curveFitter
simplified_solver
plot(y_intersect(2:100), v_rec(2:100))
plotter(h, x, t)
x_plot = y_intersect(2:100);
v_plot = v_rec(2:100);
curveFitter
simplified_solver
plot(y_intersect(2:100), v_rec(2:100))
v_plot = v_rec(2:100);
x_plot = y_intersect(2:100);
curveFitter
x_plot_agg = zeros([9, 99])
x_plot_agg (3,:) = x_plot;
v_plot_agg = zeros([9, 99]);
v_plot_agg (3,:) = v_plot;
simplified_solver
v_plot = v_rec(2:100);
x_plot = y_intersect(2:100);
x_plot_agg (1,:) = x_plot;
v_plot_agg (1,:) = v_plot;
simplified_solver
v_plot = v_rec(2:100);
x_plot = y_intersect(2:100);
x_plot_agg (2,:) = x_plot;
v_plot_agg (2,:) = v_plot;
simplified_solver
plot(y_intersect(2:100), v_rec(2:100))
v_plot = v_rec(2:100);
x_plot = y_intersect(2:100);
x_plot_agg (4,:) = x_plot;
v_plot_agg (4,:) = v_plot;
plot(x_plot_agg(1,:), v_plot_agg(1, :), x_plot_agg(2,:), v_plot_agg(2, :), x_plot_agg ↲
(3,:), v_plot_agg(3, :),x_plot_agg(4,:), v_plot_agg(4, :))
plot(x_plot_agg(1,:), v_plot_agg(1, :), x_plot_agg(2,:), v_plot_agg(2, :), x_plot_agg ↲
(3,:), v_plot_agg(3, :))
plot(x_plot_agg(1,:), v_plot_agg(1, :))
```

```
plot(x_plot_agg(4,:), v_plot_agg(4, :))
plot(x_plot_agg(3,:), v_plot_agg(3, :), x_plot_agg(4,:), v_plot_agg(4, :))
plot(x_plot_agg(2,:), v_plot_agg(2, :),x_plot_agg(3,:), v_plot_agg(3, :), x_plot_agg ↵
(4,:), v_plot_agg(4, :))
plot(x_plot_agg(2,2:80), v_plot_agg(2, 2:80),x_plot_agg(3,:), v_plot_agg(3, :), ↵
x_plot_agg(4,:), v_plot_agg(4, :))
plot(x_plot_agg(1,2:80), v_plot_agg(1, 2:80),x_plot_agg(2,2:80), v_plot_agg(2, 2:80), ↵
x_plot_agg(3,:), v_plot_agg(3, :), x_plot_agg(4,:), v_plot_agg(4, :))
legend("a = 10^{-3}", "a = 7 10^{-4}", "a = 5 10^{-4}","a = 2 10^{-4}","a = 10^{-4}")
title("v_{rec} vs x_{rec} for different h_x")
xlabel("x_{rec}")
ylabel("v_{rec}")
plot(x_plot_agg(1,2:80), v_plot_agg(1, 2:80), "*", x_plot_agg(2,2:80), v_plot_agg(2, ↵
2:80),"*", x_plot_agg(3,:), v_plot_agg(3, :), "*",x_plot_agg(4,:), v_plot_agg(4, :),"↵
*")
title("v_{rec} vs x_{rec} for different h_x")
legend("a = 10^{-3}", "a = 7 10^{-4}", "a = 5 10^{-4}","a = 2 10^{-4}","a = 10^{-4}")
xlabel("x_{rec}")
ylabel("v_{rec}")
simplified_solver
plot(y_intersect(2:100), v_rec(2:100))
v_plot = v_rec(2:100);
x_plot = y_intersect(2:100);
x_plot_agg (4,:) = x_plot;
x_plot_agg (5,:) = x_plot;
v_plot_agg (5,:) = v_plot;
simplified_solver
x_plot = y_intersect(2:100);
x_plot_agg (4,:) = x_plot;
simplified_solver
plot(y_intersect(2:100), v_rec(2:100))
v_plot = v_rec(2:100);
x_plot = y_intersect(2:100);
x_plot_agg (6,:) = x_plot;
v_plot_agg (6,:) = v_plot;
simplified_solver
plot(y_intersect(2:100), v_rec(2:100))
x_plot_agg (6,:) = x_plot;
v_plot = v_rec(2:100);
x_plot = y_intersect(2:100);
x_plot_agg (7,:) = x_plot;
v_plot_agg (7,:) = v_plot;
simplified_solver
plot(y_intersect(2:100), v_rec(2:100))
v_plot = v_rec(2:100);
x_plot = y_intersect(2:100);
x_plot_agg (8,:) = x_plot;
v_plot_agg (8,:) = v_plot;
simplified_solver
plot(y_intersect(2:100), v_rec(2:100))
v_plot = v_rec(2:100);
```

```
x_plot = y_intersect(2:100);
v_plot_agg (9,:) = v_plot;
x_plot_agg(2,2:80), v_plot_agg(2, 2:80),x_plot_agg(3,:), v_plot_agg(3, :), x_plot_agg ↵
(4,:), v_plot_agg(4, :),x_plot_agg(5,:), v_plot_agg(5, :))
plot(x_plot_agg(1,2:80), v_plot_agg(1, 2:80), "*", x_plot_agg(2,2:80), v_plot_agg(2, ↵
2:80),"*", x_plot_agg(3,:), v_plot_agg(3, :), "*",x_plot_agg(4,:), v_plot_agg(4, :),"↵
*",x_plot_agg(5,:), v_plot_agg(5, :),"*", x_plot_agg(6,:), v_plot_agg(6, :),"*",↵
x_plot_agg(7,:), v_plot_agg(7, :),"*", x_plot_agg(8,:), v_plot_agg(8, :),"*")
plot(x_plot_agg(1,2:80), v_plot_agg(1, 2:80), "*", x_plot_agg(2,2:80), v_plot_agg(2, ↵
2:80),"*", x_plot_agg(3,:), v_plot_agg(3, :), "*",x_plot_agg(4,:), v_plot_agg(4, :),"↵
*",x_plot_agg(5,:), v_plot_agg(5, :),"*", x_plot_agg(6,:), v_plot_agg(6, :),"*",↵
x_plot_agg(7,:), v_plot_agg(7, :),"*", x_plot_agg(8,:), v_plot_agg(8, :),"*",↵
x_plot_agg(9,:), v_plot_agg(9, :),"*")
x_plot_agg (9,:) = x_plot;
plot(x_plot_agg(1,2:80), v_plot_agg(1, 2:80), "*", x_plot_agg(2,2:80), v_plot_agg(2, ↵
2:80),"*", x_plot_agg(3,:), v_plot_agg(3, :), "*",x_plot_agg(4,:), v_plot_agg(4, :),"↵
*",x_plot_agg(5,:), v_plot_agg(5, :),"*", x_plot_agg(6,:), v_plot_agg(6, :),"*",↵
x_plot_agg(7,:), v_plot_agg(7, :),"*", x_plot_agg(8,:), v_plot_agg(8, :),"*",↵
x_plot_agg(9,:), v_plot_agg(9, :),"*")
"a = 7 10^{-5}"
legend("a = 10^{-3}", "a = 7 10^{-4}", "a = 5 10^{-4}","a = 2 10^{-4}","a = 10^{-4}","↵
a = 7 10^{-5}","a = 5 10^{-5}","a = 2 10^{-5}","a =10^{-5}" )
plot(x_plot_agg(1,2:80), v_plot_agg(1, 2:80), "*", x_plot_agg(2,2:80), v_plot_agg(2, ↵
2:80),"*", x_plot_agg(3,:), v_plot_agg(3, :), "*",x_plot_agg(4,:), v_plot_agg(4, :),"↵
*",x_plot_agg(5,:), v_plot_agg(5, :),"*", x_plot_agg(6,:), v_plot_agg(6, :),"*",↵
x_plot_agg(7,:), v_plot_agg(7, :),"*", x_plot_agg(8,:), v_plot_agg(8, :),"-",↵
x_plot_agg(9,:), v_plot_agg(9, :),"-")
legend("a = 10^{-3}", "a = 7 10^{-4}", "a = 5 10^{-4}","a = 2 10^{-4}","a = 10^{-4}","↵
a = 7 10^{-5}","a = 5 10^{-5}","a = 2 10^{-5}","a =10^{-5}" )
plot(x_plot_agg(1,2:80), v_plot_agg(1, 2:80), "*", x_plot_agg(2,2:80), v_plot_agg(2, ↵
2:80),"*", x_plot_agg(3,:), v_plot_agg(3, :), "*",x_plot_agg(4,:), v_plot_agg(4, :),"↵
*",x_plot_agg(5,:), v_plot_agg(5, :),"*", x_plot_agg(6,:), v_plot_agg(6, :),"*",↵
x_plot_agg(7,:), v_plot_agg(7, :),"*", x_plot_agg(8,:), v_plot_agg(8, :),"o",↵
x_plot_agg(9,:), v_plot_agg(9, :),"o")
legend("a = 10^{-3}", "a = 7 10^{-4}", "a = 5 10^{-4}","a = 2 10^{-4}","a = 10^{-4}","↵
a = 7 10^{-5}","a = 5 10^{-5}","a = 2 10^{-5}","a =10^{-5}" )
xlabel("x_{rec}")
vlabel("v_{vec}")
ylabel("v_{vec}")
title("v_{rec} vs x_{rec} for different h_x")
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plotter(abs(h), x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
```

```
simplified_solver
plotter(h, x, t)
plot(y_intersect(2:100), v_rec(2:100))
plot(y_intersect(2:80), v_rec(2:80))
plot(y_intersect(2:75), v_rec(2:75))
plot(y_intersect(2:70), v_rec(2:70))
plot(y_intersect(2:65), v_rec(2:65))
plot(y_intersect(2:60), v_rec(2:60))
plot(y_intersect(2:55), v_rec(2:55))
plot(y_intersect(2:57), v_rec(2:57))
plot(y_intersect(2:55), v_rec(2:55))
simplified_solver
plotter(h, x, t)
plotter(S, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plot(y_intersect(2:55), v_rec(2:55))
plot(y_intersect(2:52), v_rec(2:52))
plot(y_intersect(2:47), v_rec(2:47))
plot(y_intersect(2:49), v_rec(2:49))
v_Q_agg = zeros(6, 48)
v_Q_agg(1) = v_rec(2:49);
v_Q_agg(1,:) = v_rec(2:49);
x_Q_agg = zeros(6, 48);
x_Q_agg(1, :) = y_intersect(2:49);
simplified_solver
plot(y_intersect(2:49), v_rec(2:49))
v_Q_agg(2,:) = v_rec(2:49);
x_Q_agg(2, :) = y_intersect(2:49);
simplified_solver
plot(y_intersect(2:49), v_rec(2:49))
v_Q_agg(3,:) = v_rec(2:49);
x_Q_agg(3, :) = y_intersect(2:49);
simplified_solver
plot(y_intersect(2:49), v_rec(2:49))
v_Q_agg(4,:) = v_rec(2:49);
x_Q_agg(4, :) = y_intersect(2:49);
plot(x_Q_agg(1,:), v_Q_agg(1,:), "*", x_Q_agg(2,:), v_Q_agg(2,:), "*", x_Q_agg(3,:),↙
v_Q_agg(3,:), "*", x_Q_agg(4,:), v_Q_agg(4,:), "*")
legend("Q = 8 10^{-6}", "Q = 2 10^{-5}", "Q = 8 10^{-5}","Q = 2 10^{-4}" )
title("v_{rec} vs x_{rec} for different Q")
```

```
xlabel("x_{rec}")
ylabel("v_{rec}")
simplified_solver
plotter(h, x, t)
simplified_solver
plot(t, v_rec)
plot(ht, v_rec)
plot(htr, v_rec)
plot(ht_r, v_rec)
plot(ht_l, v_rec)
plot(St_l, v_rec)
simplified_solver
plot(t, v_rec)
simplified_solver
plot(t, v_rec)
simplified_solver
plot(t, v_rec)
simplified_solver
plot(t, v_rec)
simplified_solver
plot(t, v_rec)
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plotter(abs(h), x, t)
plot(x, h(1, :))
plot(x, h(2, :))
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
plot(x, h(1, :), x, h(2, :))
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
plot(x, h(1, :), x, h(2, :))
simplified_solver
plot(x, h(1, :), x, h(2, :))
plot(x, abs(h(2, :)))
simplified_solver
plot(x, h(1, :), x, h(2, :))
plotter(abs(h), x, t)
plot(t, v_rec)
```

```matlab
simplified_solver
plot(t, v_rec)
plot(St, v_rec)
plot(St_r, v_rec)
plot(St_r(1:20), v_rec(1:20))
plot(St_r(1:10), v_rec(1:10))
plot(St_r(1:30), v_rec(1:30))
plot(St_r(1:40), v_rec(1:40))
plot(t, St_r
plot(t, St_r)
plot(t(100:500), St_r(100:500))
plot(t(150:500), St_r(150:500))
plot(St_r(150:500), v_rec(150:500))
title("v_{rec} vs h_{xt}")
xlabel("h_{xt}")
ylabel("v_{rec}")
title("v_{rec} vs h_{xt} for dt = 0.34, Q = 10^{-2}, h_x = 10^{-4}")
simplified_solver
plot(t(150:500), St_r(150:500))
plot(t, St_r)
plot(t(1:40), St_r(1:40))
plot(St_r(1:40), v_rec(1:40))
plot(St_r(1:40), v_rec(1:40), "x")
plot(t, St_r, "x")
plot(St_r(2:40), v_rec(2:40) "x")
plot(St_r(2:40), v_rec(2:40), "x")
plot(St_l(2:40), v_recL(2:40), "x")
plot(t, St_L, "x")
plot(t, St_l, "x")
plot(t, LHm, "x")
plot(t, v_recL, "x")
plot(t, St_L, "x")
plot(t, St_l, "x")
plot(t(1:40), St_l(1:40), "x")
plot(t(1:40), St_l(1:40))
simplified_solver
plot(t(1:40), St_l(1:40))
plot(t(1:100), St_l(1:100))
plot(t, St_l)
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plot(t, St_l)
plot(t, St)
plot(t, St(:, 50))
plot(t, St(:, 10))
plot(t, St(:, 1))
simplified_solver
plot(t, St(:, 1))
simplified_solver
plot(t, St(:, 1))
```

```
simplified_solver
plot(t, St(:, 1))
plot(t, St(:, 4))
plot(t, St(:, 50))
plot(t, St)
plot(t, St_l)
plot(x, h(1, :), x, h(50, :), x, h(100, :))
plot(x, S(1, :), x, S(50, :), x, S(100, :))
plot(x, St(1, :), x, St(50, :), x, St(100, :))
plot(t, St_l)
simplified_solver
plot(t, St_l)
plot(x, S(1, :), x, S(50, :), x, S(100, :), x, S(294, :), x, S(400,:))
plot(t, LHm)
plot(t, v_recL)
plot(t(1:294), v_recL(1:294))
simplified_solver
plot(t, v_recL)
plot(t, LHm)
plot(t, St_l)
simplified_solver
plot(t, v_recL)
plot(t, LHm)
plot(t, St_l)
plot(t, LHm)
plot(t, St_l)
plot(St_l, v_recL)
simplified_solver
plot(t, St_l)
plot(St_l, v_recL)
plot(t, v_recL)
simplified_solver
plot(t, v_recL)
plot(St_l, v_recL)
plot(t, St_l)
plot(t, St_l, "x")
simplified_solver
plot(t, St_l, "x")
plot(St_l, v_recL)
plot(t, v_recL)
plot(St_l, v_recL, "x")
plot(St_l(2:40), v_recL(2:40), "x")
plot(t, prop_speed(1, :))
plot(t, prop_speed(:, 1))
plotter(prop_speed, x, t)
simplified_solver
plotter(prop_speed, x, t)
title("theoretical v_{prop} for h_x = 10^{-4}, Q = 10^{-2}, tanh, dx = 2 10^{-3}, dt = ↵
1.7")
xlabel("x")
ylabel("t")
```

```
v_diff = prop_speed - dx/dt;
plotter(v_diff, x, t)
max(abs(prop_speed))
abs(max(v_diff));
abs(max(v_diff);
abs(max(v_diff))
plotter(v_diff, x, t)
dx/dt
max(prop_speed(1,:))
max(prop_speed(:,:))
v_p2 = 6/5*Q^(3/5)*S.^(1/5)/(1+S).^(8/5);
v_p2 = 6/5*Q^(3/5).*S.^(1/5)./(1+S).^(8/5);
v_diff2 = v_p2 - dx/dt;
plotter(v_diff2, x, t)
simplified_solver
v_diff = prop_speed - dx/dt;
plotter(v_diff, x, t)
v_p2 = 6/5*Q^(3/5).*S.^(1/5)./(1+S).^(8/5);
v_diff2 = v_p2 - dx/dt;
plotter(v_diff, x, t)
plotter(v_diff2, x, t)
simplified_solver
v_diff2 = v_p2 - dx/dt;
v_p2 = 6/5*Q^(3/5).*S.^(1/5)./(1+S).^(8/5);
v_diff2 = v_p2 - dx/dt;
plotter(v_diff2, x, t)
min(v_diff2)
plotter(prop_speed, x, t)
simplified_solver
plotter(prop_speed, x, t)
v_p2 = 6/5*Q^(3/5).*S.^(1/5)./(1+S).^(8/5);
v_diff2 = v_p2 - dx/dt;
plotter(v_diff2, x, t)
min(v_diff2)
%-- 2023-07-17 12:03 PM --%
simplified_solver
plotter(h, x, t)
plot(dx/dt - prop_speed)
plotter(dx/dt - prop_speed, x, t)
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
simplified_solver
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
simplified_solver
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
plotter(dx/dt - prop_speed, x, t)
simplified_solver
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
```

```
simplified_solver
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
plotter(dx/dt - prop_speed, x, t)
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
plotter(dx/dt - prop_speed2, x, t)\
plotter(dx/dt - prop_speed2, x, t)
plotter(prop_speed, x, t)
simplified_solver
plotter(prop_speed, x, t)
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
plotter(prop_speed2, x, t)
simplified_solver
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
plotter(h, x, t)
simplified_solver
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
plotter(prop_speed, x, t)
plotter(dx/dt - prop_speed, x, t)
plotter(h, x, t);
simplified_solver
plotter(dx/dt - prop_speed, x, t)
simplified_solver
plotter(dx/dt - prop_speed, x, t)
plotter(h, x, t);
simplified_solver
plotter(dx/dt - prop_speed, x, t)
simplified_solver
plotter(dx/dt - prop_speed, x, t)
simplified_solver
plotter(dx/dt - prop_speed, x, t)
xlabel("x")
ylabel("t")
zlabel("dx/dt - v_{prop}")
title("dx/dt - v_{prop} for tanh h_x ~ 10^{-4}, Q ~ 10^{-4} with dx = 0.02, dt = ↙
0.34")
plotter(h, x, t)
xlabel("x")
ylabel("t")
zlabel("h")
title("h(x,t) for nonsmooth CFL compliant case")
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
simplified_solver
```

```
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
simplified_solver
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
plotter(dx/dt - prop_speed, x, t)
simplified_solver
plotter(dx/dt - prop_speed, x, t)
plotter(abs(h), x, t)
plotter(dx/dt - prop_speed, x, t)
prop_speed2 = 6/5*S.^(1/5).*Q^(3/5);
plotter(dx/dt - prop_speed2, x, t)
plotter(prop_speed, x, t)
max(prop_speed(4,:))
simplified_solver
plot(t, x_vp_max, t, y_intersect)
plot(t, x_vp_max, t, RHm)
plot(t, x_vp_max, t, LHm)
plot(t, x_vp_max, t, LHm-0.1)
plot(t, x_vp_max, t, LHm-0.01)
plot(t, x_vp_max, t, LHm)
plot(t, x_vp_max, t-0.01, LHm)
plot(t, x_vp_max, t, LHm+0.01)
plot(t(1:40), x_vp_max(1:40), t(1:40), LHm(1:40)+0.01)
plot(t(1:100), x_vp_max(1:100), t(1:100), LHm(1:100))
```

```
simplified_solver
plot(t(1:100), x_vp_max(1:100), t(1:100), LHm(1:100))
plot(t(1:200), x_vp_max(1:200), t(1:200), LHm(1:200))
plot(t(1:400), x_vp_max(1:400), t(1:400), LHm(1:400))
simplified_solver
plot(t(1:400), x_vp_max(1:400), t(1:400), x_vp2_max(1:400), t(1:400), LHm(1:400))
plotter(prop_speed2, x, t)
plot(t(1:400), x_vp_max(1:400), t(1:400), LHm(1:400))
plot(v_recL, St)
plot(v_recL, St_l)
plot(v_recL(1:400), St_l(1:400))
plot(v_recL(1:40), St_l(1:40))
plot(v_recL(1:30), St_l(1:30))
plot(v_recL(1:25), St_l(1:25))
plot(v_recL(1:10), St_l(1:10))
plot(v_recL(1:400), St_l(1:400), "x")
plot(v_recL, St_l, "x")
plot(v_recL, St_r, "x")
plot(v_recL, St_l, "x")
curveFitter
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plotter(prop_speed, x, t)
simplified_solver
plotter(prop_speed, x, t)
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plotter(abs(h_, x, t)
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
simplified_solver
plotter(abs(h), x, t)
plot(t, St_l)
```

```
plot(v_recL, St_l)
plot(v_recL, St_l, "x")
plot(t, v_recL)
plot(t, v_recL, "x")
plot(t, v_rec, "x")
plot(t, LHm, "x")
plot(t, v_rec, "x")
simplified_solver
plot(t, v_rec, "x")
simplified_solver
plotter(h, x, t)
plot(t, v_rec, "x")
plot(y_intersect, v_rec, "x")
plot(t, y_intersect, "x")
curveFitter
plot(St_l, y_intersect, "x")
plot(St_r, y_intersect, "x")
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plot(St_r, y_intersect, "x")
plot(t, St_r)
plot(t, St_l)
simplified_solver
plot(t, St_l)
simplified_solver
plot(t, St_l)
plotter(h, x, t)
simplified_solver
plotter(h, x, t)
plot(t, St_l)
plot(t(1:400), St_l(1:400))
plot(t(1:400), St_l(1:400), "x")
simplified_solver
plotter(h, x, t)
plot(t(1:400), St_l(1:400), "x")
plot(t(1:400), St_l(1:400))
plot(t(1:400), LHm(1:400))
plot(St_l(1:400), LHm(1:400))
simplified_solver
plot(t(1:400), St_l(1:400))
simplified_solver
plot(t(1:400), St_l(1:400))
plot(t, St_l)
plot(t(20:600), St_l(20:600))
plot(t(50:800), St_l(50:800))
```

```
plot(t(70:800), St_l(70:800))
plot(t(80:800), St_l(80:800))
plot(t(100:800), St_l(100:800))
plot(St_l(100:800), LHm(100:800))
St_l_plot = St_l(100:800)
x_rec_plot = LHm(100:800)
curveFitter
plotter(h, x, t);
plotter(t, v_rec, t, prop_speed)
plot(t, v_rec, t, prop_speed)
plot(t, v_rec)
plot(t, v_recL)
plot(t, v_rec)
plot(t, LHm)
plot(t(1:400), LHm(1:400))
plot(t(1:400), v_rec(1:400))
plotter(t, v_rec, t, prop_speed)
plot(t(1:400), v_rec(1:400), t(1:400), prop_speed(1:400))
plot(t(1:400), prop_speed(1:400))
plot(t(1:400), v_recL(1:400), t(1:400), prop_speed(1:400))
plot(t, y_intersect)
plot(t, LHm)
plot(t(1:400), LHm(1:400))
loglog(t(1:400), LHm(1:400))
loglog(t(1:400), LHm(1:400)-LHm(1))
loglog(t(1:400), LHm(1:400)-LHm(1), t(1:400), 1/(t(1:400)))
loglog(t(1:400), LHm(1:400)-LHm(1), t(1:400), 1./(t(1:400)))
help loglog
loglog(t(1:400), LHm(1:400)-LHm(1))
loglog(t(1:400), abs(LHm(1:400)-LHm(1)), t(1:400), 1./(t(1:400)))
loglog(t(1:400), abs(LHm(1:400)-LHm(1)), t(1:400), 1./sqrt(t(1:400)))
loglog(t(1:400), abs(LHm(1:400)-LHm(1)), t(1:400), sqrt((t(1:400))))
simplified_solver
plot(t, y_intersect)
plot(t, LHm)
simplified_solver
plot(t, LHm)
simplified_solver
plot(t, LHm)
loglog(t, LHm)
loglog(t, LHm-LHm(1))
loglog(t, LHm(1)-LHm)
curveFitter
LHm_plot = LHm(1) - LHm
curveFitter
plot(S, x-LHm)
plot(S(2,:), x(2,:)-LHm(2))
plot(x-LHm, S(2, :))
plot(x-LHm(2), S(2, :))
plot(x-LHm(10), S(10, :))
plot(x-LHm(10), S(10, :), x-LHm(100), S(100, :), x-LHm(200), S(200, :), x-LHm(300), S ↙
```

```
(300, :))
plot(x-LHm(10), S(10, :), x-LHm(100), S(100, :), x-LHm(200), S(200, :))
plot(x-LHm(10), S(10, :), x-LHm(100), S(100, :))
plot(x-LHm_plot(10), S(10, :), x-LHm_plot(100), S(100, :))
plot(x-LHm_plot(10), S(10, :), x-LHm_plot(150), S(150, :))
plot(x-LHm(200), S(200, :), x-LHm(400), S(400, :))
plot(x, S(2,:), x, S(50, :), x, S(100,:))
plot(x, S(2,:), x, S(50, :), x, S(100,:), x, S(200,:))
plot(x, S(2,:), x, S(50, :), x, S(100,:), x, S(200,:), x, S(300,:))
plot(x-LHm(200), S(200, :)-max(S(200,:)), x-LHm(400), S(400, :))-max(S(400,:)))
plot(x-LHm(200), S(200, :)-max(S(200,:)), x-LHm(400), S(400, :)-max(S(400,:)))
plot(x-LHm(200), -S(200, :)+max(S(200,:)), x-LHm(400), -S(400, :)+max(S(400,:)))
plot(x-LHm(200), -S(200, :)+max(S(200,:)), x-LHm(250), -S(250, :)+max(S(250,:)))
plot(x-LHm(200), -S(200, :)+max(S(200,:)), x-LHm(250), -S(220, :)+max(S(220,:)))
plot(x-LHm(200), -S(200, :)+max(S(200,:)), x-LHm(210), -S(210, :)+max(S(210,:)))
plot(x-LHm(200), -S(200, :)+max(S(200,:)), x-LHm(205), -S(205, :)+max(S(205,:)))
for i = 1:nt
eta (i) = x - LHm(i);
end
eta = zeros(nt);
for i = 1:nt
end
eta = zeros(nt, nx);
for i = 1:nt
eta(i, :) = x - LHm(i);
end
plot(eta(1,:), S(1, :), eta(10, :), S(10, :), eta(50, :), S(50,:))
plot(eta(1,:), S(1, :), eta(10, :), S(10, :), eta(50, :), S(50,:), eta(100, :), S(100, ↙
:))
S_max = zeros(nt, nx);
for i = 1:nt
for j = 1:nx
if S(i,j) = max(S(i,:))
if S(i,j) == max(S(i,:))
S_max(i,j) = S(i,j)
end
end
plot(x, S_max(10, :))
plot(eta(1,:), max(S(1, :)), eta(10, :), max(S(10, :)), eta(50, :), max(S(50,:)), eta ↙
(100, :), max(S(100, :)))
plot(eta(1,:), max(S(1, :)), "x", eta(10, :), max(S(10, :)), "x")
eta_p = zeros(nt)
S_eta_p = zeros(nt);
for j = 1:nt
for i = 1:nx
if S(j, i) == max(S(j,:))
end
end
S_eta_p = max(S(j,:));
for j = 1:nt
for i = 1:nx
```

```matlab
if S(j, i) == max(S(j,:))
S_eta_p(j) = S(j, i);
eta_p = eta(j,i);
end
end
end
plot(eta_p, S_eta_p, "x")
S_eta_p = zeros([1, nt]);
eta_p = zeros([1, nt]);
for j = 1:nt
for i = 1:nx
if S(j, i) == max(S(j,:))
S_eta_p(j) = S(j, i);
eta_p(j) = eta(j,i);
end
end
end
plot(eta_p, S_eta_p, "x")
plot(eta_p(1:200), S_eta_p(1:200), "x")
plot(eta_p(1:175), S_eta_p(1:175), "x")
xlabel("\eta")
ylabel("S_{max}")
title("maximal slope vs \eta = x - x_{rec,L} for initial tanh")
title("maximal slope vs \eta = x - x_{rec,L} for initial tanh, t < 96.25")
eta_p = eta_p + LHm(1);
plot(eta_p(1:175), S_eta_p(1:175), "x")
eta_p = eta_p - LHm(1);
plot(eta_p(175:nt), S_eta_p(75:nt), "x")
plot(eta_p(175:nt), S_eta_p(`75:nt), "x")
plot(eta_p(175:nt), S_eta_p(175:nt), "x")
plot(eta_p(200:nt), S_eta_p(200:nt), "x")
plot(eta_p(205:nt), S_eta_p(205:nt), "x")
plot(eta_p(210:nt), S_eta_p(210:nt), "x")
plot(eta_p(215:nt), S_eta_p(215:nt), "x")
title("maximal slope vs \eta = x - x_{rec,L} for initial tanh, t > 118.25")
ylabel("S_{max}")
xlabel("\eta")
plot(eta_p(175:215), S_eta_p(175:215), "x")
xlabel("\eta")
ylabel("S_{max}")
title("maximal slope vs \eta = x - x_{rec,L} for initial tanh, 96.25 < t < 118.25")
plotter(prop_speed, x, t)
plotter(prop_speed2, x, t)
plotter(prop_speed, x, t)
plot(x, S(10,:), x, S(50, :), x, S(100, :), x, S(150, :), x, S(200, :))
plot(x, h(10,:), x, h(50, :), x, h(100, :), x, h(150, :), x, h(200, :))
plot(eta(100, :), S(100,:), eta(125, :), S(125,:), eta(150,:), S(150,:))
plot(eta(100, :), S(100,:), eta(125, :), S(125,:), eta(150,:), S(150,:), eta(175,:), S ↵
(175, :))
yaxis("log")
axis("log")
```

```matlab
axis help
help axis
semilogy(eta(100, :), S(100,:), eta(125, :), S(125,:), eta(150,:), S(150,:), eta ↵
(175,:), S(175, :))
ylabel("S(\eta) log scaled")
xlabel("\eta")
title("S(\eta) vs \eta for t<96.25 initial tanh")
semilogy(eta(215, :), S(215,:), eta(250, :), S(250,:), eta(300,:), S(300,:), eta ↵
(400,:), S(40, :))
semilogy(eta(215, :), S(215,:), eta(250, :), S(250,:), eta(300,:), S(300,:), eta ↵
(400,:), S(400, :))
semilogy(eta(100, :), S(100,:), eta(125, :), S(125,:), eta(150,:), S(150,:), eta ↵
(175,:), S(175, :))
legend("t = 55", "t = 68.75", "t = 82.5", "t = 96.25")
plot(eta(215, :), S(215,:), eta(250, :), S(250,:), eta(300,:), S(300,:), eta(400,:), S ↵
(400, :))
semilogx(eta(215, :), S(215,:), eta(250, :), S(250,:), eta(300,:), S(300,:), eta ↵
(400,:), S(400, :))
plot(eta(215, :), S(215,:), eta(250, :), S(250,:), eta(300,:), S(300,:), eta(400,:), S ↵
(400, :))
plot(eta(215, :), S(215,:)-slopethresh, eta(250, :), S(250,:)-slopethresh, eta(300,:), ↵
S(300,:)-slopethresh, eta(400,:), S(400, :)-slopethresh)
plot(eta(215, :), S(215,:)-slope_thresh, eta(250, :), S(250,:)-slope_thresh, eta ↵
(300,:), S(300,:)-slope_thresh, eta(400,:), S(400, :)-slope_thresh)
plot(eta(215, :), (S(215,:)-slope_thresh)/slope_thresh, eta(250, :), (S(250,:)- ↵
slope_thresh)/slope_thresh, eta(300,:), (S(300,:)-slope_thresh)/slope_thresh, eta ↵
(400,:), (S(400, :)-slope_thresh)/slope_thresh)
plot(t, y_intersect)
plot(t, y_intersect-Lhm)
plot(t, y_intersect-LHm)
eta_norm = eta/(y_intersect-LHm);
eta_norm = eta./(y_intersect-LHm);
eta_norm = eta;
eta_norm = eta./(y_intersect-LHm);
for i = 1:nt
eta_norm(i, :) = eta(i,:)./(y_intersect(i) - LHm(i));
end
plot(eta_norm(215, :), S(215,:), eta_norm(250, :), S(250,:), eta_norm(300,:), S ↵
(300,:), eta_norm(400,:), S(400, :))
xlabel("\hat \eta = (x - x_{vec,L})/(x_{vec,R}- x_{vec,L})")
xlabel("\hat{} \eta = (x - x_{vec,L})/(x_{vec,R}- x_{vec,L})")
xlabel("\vec \eta = (x - x_{vec,L})/(x_{vec,R}- x_{vec,L})")
xlabel("\vec{\eta} = (x - x_{vec,L})/(x_{vec,R}- x_{vec,L})")
xlabel("\eta = (x - x_{vec,L})/(x_{vec,R}- x_{vec,L})")
ylabel("S(\eta)")
title("S(\eta) vs \eta for t>118.25 initial tanh")
legend("t = 118.25", "t = 137.5", "t = 165", "t = 220")
h_eta = linspace(1e-9, 1e-2, 1000)
t_eta = linspace(0, 220, 1000);
h_eta_2 = 5*(h_eta.').^(11/5).*Q^(-2/5).*0.0290*t.^(-1/2)*(h_eta.'.^(1/5).*Q^{3/5} + ↵
1/2.*0.0290.*t.'.^(-1/2));
```

```
h_eta_2 = 5*(h_eta.^(11/5)).'.*Q^(-2/5).*0.0290*t.^(-1/2)*(h_eta.'.^(1/5).*Q^{3/5} + ↵
1/2.*0.0290.*t.'.^(-1/2));
h_eta_2 = 5*(h_eta.^(11/5)).'.*Q^(-2/5).*0.0290*t.^(-1/2)*((h_eta.').^(1/5).*Q^{3/5} + ↵
1/2.*0.0290.*(t.').^(-1/2));
h_eta_2 = 5*(h_eta.^(11/5))'.*Q^(-2/5).*0.0290*t.^(-1/2)*((h_eta').^(1/5).*Q^{3/5} + ↵
1/2.*0.0290.*(t').^(-1/2));
h_eta'
h_eta_2 = 5*(h_eta.^(11/5))'.*Q^(-2/5).*0.0290*t_eta.^(-1/2)*((h_eta').^(1/5).*Q^{3/5} ↵
+ 1/2.*0.0290.*(t_eta').^(-1/2));
t_eta.^(-1/2)
h_eta_2 = 5*(h_eta.^(11/5))'.*Q^(-2/5).*0.0290*t_eta.^(-1/2)*((h_eta').^(1/5).*Q^{3/5} ↵
+ 1/2.*0.0290.*(t_eta').^(-1/2));
h_eta_2 = 5*(h_eta.^(11/5))'.*Q^(-2/5).*0.0290.*(t_eta.^(-1/2))*((h_eta').^(1/5).*Q^ ↵
{3/5} + 1/2.*0.0290.*(t_eta').^(-1/2));
h_eta_phasePlot
t_eta.^(-1/2)
(t_eta.^(-1/2))'
h_eta_phasePlot
(h_eta).^(1/5)
(h_eta).^(1/5)'
t_eta.^(-1/2)'
Q^{3/5}*h_eta_pow2
Q^{3/5}>*h_eta_pow2
Q^{3/5}.*h_eta_pow2
1e-3.*h_eta_pow2
h_eta_phasePlot
plotter(h_eta_2, h_eta, t_eta)
h_eta_phasePlot
plotter(h_eta_2, h_eta, t_eta)
h_eta_phasePlot
plotter(h_eta_2, h_eta, t_eta)
h_eta_phasePlot
(t_eta_pow')*inner
h_eta_pow.*(t_eta_pow')*inner;
h_eta_phasePlot
plotter(h_eta_2, h_eta, t_eta)
xlabel("h_{\eta}")
ylabel("t")
zlabel("h_{\eta \eta})")
title("Phase Plot for h_{\eta \eta}")
zlabel("h_{\eta \eta}")
h_eta_solver
plotter(h_eta_sol, eta, t)
plot(eta, h_eta_sol(1,:), eta, h_eta_sol(100,:), eta, h_eta_sol(500,:), eta, h_eta_sol ↵
(1000,:))
h_eta_solver
plotter(h_eta_sol, eta, t)
plot(eta, h(1, :), eta, h(2, :))
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(2, :))
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(3, :))
h_eta_solver
```

```
plotter(h_eta_sol, eta, t)
h_eta_solver
plotter(h_eta_sol, eta, t)
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(5, :), eta, h_eta_sol(10, :))
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(50, :), eta, h_eta_sol(100, :))
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(50, :), eta, h_eta_sol(1000, :))
h_eta_solver
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(50, :), eta, h_eta_sol(1000, :))
h_eta_solver
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(50, :), eta, h_eta_sol(1000, :))
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(50, :), eta, h_eta_sol(10, :))
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(5, :), eta, h_eta_sol(10, :))
h_eta_solver
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(5, :), eta, h_eta_sol(10, :))
h_eta_solver
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(5, :), eta, h_eta_sol(10, :))
h_eta_solver
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(5, :), eta, h_eta_sol(10, :))
h_eta_solver
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(5, :), eta, h_eta_sol(10, :))
h_eta_solver
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(5, :), eta, h_eta_sol(10, :))
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(50, :), eta, h_eta_sol(100, :))
plot(eta, h_eta_sol(1, :), eta, h_eta_sol(500, :), eta, h_eta_sol(1000, :))
xlabel("\eta")
ylabel("h_{\eta}")
title("h_{\eta} vs \eta, explicitly solved according to ODE h_x ~ 1e-1 thresh")
legend("t = 0", "t = 110", "t = 220")
plot(eta(100, :), S(100,:), eta(125, :), S(125,:), eta(150,:), S(150,:), eta(175,:), S ↵
(175, :))
```