

```

clear; close all
% 1) load system matrices
% 2) convert to CT
% 3) expand TM
% 4) make TM
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
load('matfiles\truss3\sys_est_000_u')
load('matfiles\truss3\sys_est_000_d')
load('matfiles\truss3\sys_est_001_u')
load('matfiles\truss3\sys_est_001_d')

load('matfiles\truss3\truss3_model')
load('matfiles\truss3\truss3_simulation')

[~,Lambda_ref] = ss_dt_eig(sys_est_000_u.A, sys_est_000_u.C, dt);

%% choose s-value
w = 0.12; i = 2;
s = complex(real(Lambda_ref(i)), w*imag(Lambda_ref(i)));

%% Exact, full model
sys1 = make_ss_ct(Kg, Cg, Mg, 1:28, 1:28);
sys2 = make_ss_ct(Kg_d, Cg, Mg_d, 1:28, 1:28);
G_model = maketm(sys1.A, sys1.B, sys1.C, 0, s);
G_model_d = maketm(sys2.A, sys2.B, sys2.C, 0, s);
[~,~,V] = svd(G_model_d-G_model);
d = G_model*V(:,end);
eps = barstrains(meshdata, input, d);
% bar(eps)
bar(abs(d)./max(abs(d)))
set(gca, 'YScale','log')

%% Load distribution matrix
dofs = union(in_dof, out_dof);
% dofs = in_dof;
B2 = zeros(numel(z0)/2,numel(dofs));
for i = 1:numel(dofs)
    B2(dofs(i),i) = 1;
end

%% Estimated, no noise
[Ac, Bc] = dt2ct(sys_est_000_u.A, sys_est_000_u.B, dt);
[Bexp, Cexp] = ExpandBandC(Ac, Bc, sys_est_000_u.C, 1:28, in_dof, []);
G_1 = maketm(Ac, Bexp, Cexp, 0, s);

[Ac, Bc] = dt2ct(sys_est_000_d.A, sys_est_000_d.B, dt);
[Bexp, Cexp] = ExpandBandC(Ac, Bc, sys_est_000_d.C, 1:28, in_dof, []);
G_1_d = maketm(Ac, Bexp, Cexp, 0, s);

% G_1 = maketm(sys_est_000_u.A, sys_est_000_u.B, sys_est_000_u.C, 0, s);
% G_1_d = maketm(sys_est_000_d.A, sys_est_000_d.B, sys_est_000_d.C, 0, s);

DG_1 = G_1_d-G_1;
[~,S,V] = svd(DG_1);

% plot(diag(S)./max(diag(S)))
d = G_model*V(:,end);
% eps = barstrains(meshdata, input, d);
% bar(eps)
bar(abs(d)./max(abs(d)))
set(gca, 'YScale','log')

```

```
%% Estimated model, with noise
% [Ac, Bc] = dt2ct(sys_est_001_u.A, sys_est_001_u.B, dt);
% [Bexp, Cexp] = ExpandBandC(Ac, Bc, sys_est_001_u.C, out_dof, in_dof, []);
% G_2 = maketm(Ac, Bexp, Cexp, 0, s);

G_2 = maketm(sys_est_001_u.A, sys_est_001_u.B, sys_est_001_u.C, 0, s);

% [Ac, Bc] = dt2ct(sys_est_001_d.A, sys_est_001_d.B, dt);
% [Bexp, Cexp] = ExpandBandC(Ac, Bc, sys_est_001_d.C, out_dof, in_dof, []);
% G_2_d = maketm(Ac, Bexp, Cexp, 0, s);

G_2_d = maketm(sys_est_001_d.A, sys_est_001_d.B, sys_est_001_d.C, 0, s);

[~,S,V] = svd(G_2_d-G_2);
% bar(diag(S)./max(diag(S)))
% set(gca, 'YScale','log')
v = zeros(size(G_model,1),size(V,2));
v(in_dof,:) = V;

d = G_model*v(:,end);

bar(abs(d)./max(abs(d)))
set(gca, 'YScale','log')

[~,l2] = ss_dt_eig(sys_est_001_u.A, sys_est_001_u.C, dt)
```