Simulation Summary for Spatial Wishart Process Approximated via Log-Gamma Method

Load Simulation Result Object

```
clear all
load('SWP_approx_Log_Gamma_Template.mat')
```

Degree of Freedom

MCMC chain of DOF

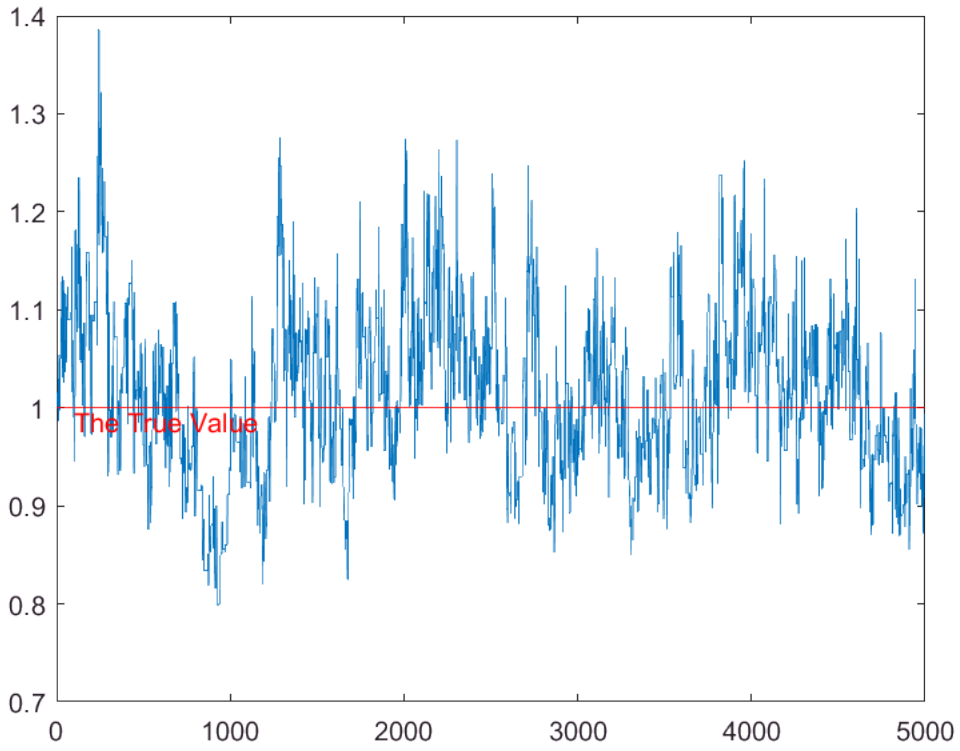
```
dof_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    dof_curr=obj{1};
   dof_all=[dof_all dof_curr('dof')];
end
plot(dof_all)
h = hline(dof,'r','The True Value');
```

Spatial range (ρ_w) of Gaussian Process

MCMC of ρ_w

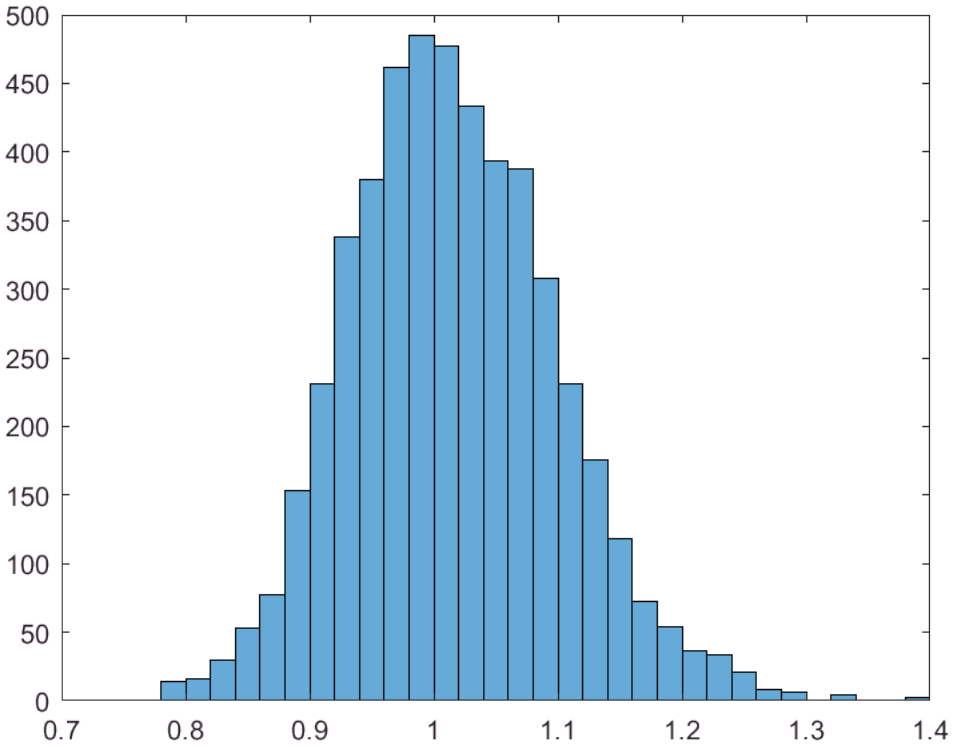
```
rho_w_all=[];
```

```
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    rho_w_curr=obj{2};
   rho_w_all=[rho_w_all rho_w_curr('rho_w')];
end
plot(rho_w_all)
h =hline(rho_w,'r','The True Value');
```



Posterior Density of ρ_w

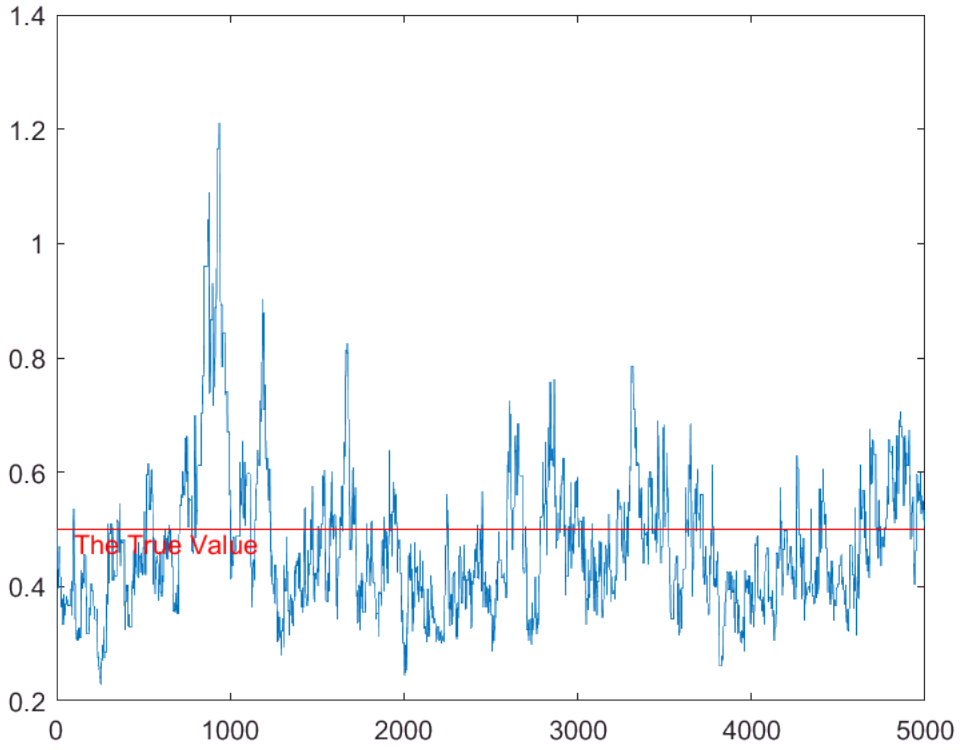
```
histogram(rho_w_all)
```



Spatial DOF (ν_w) of Gaussian Process

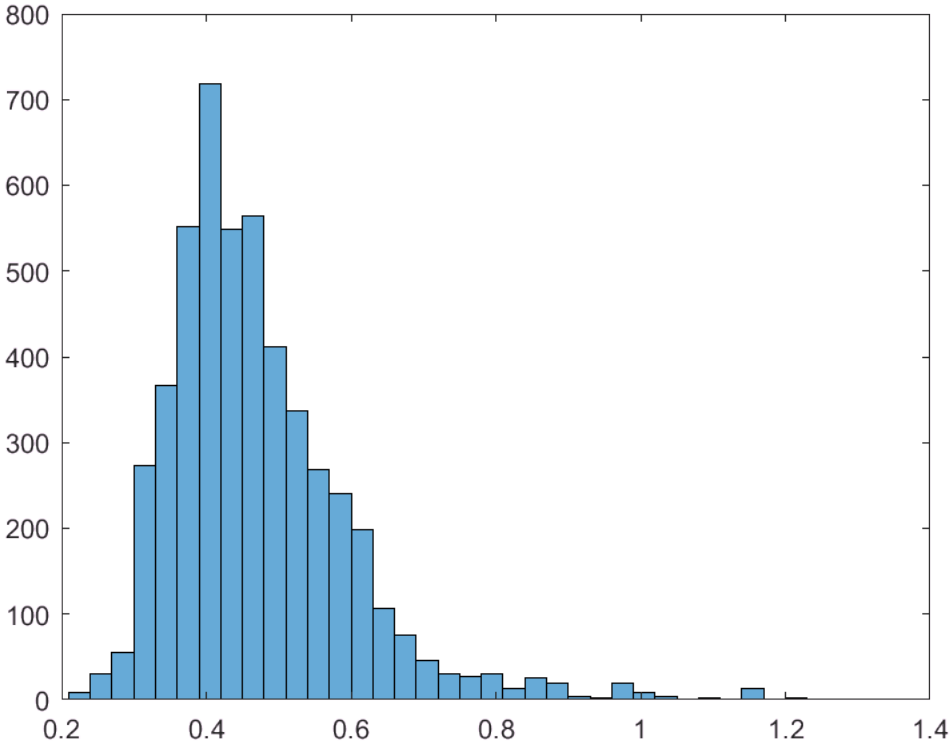
MCMC of ν_w

```
nu_w_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    nu_w_curr=obj{2};
   nu_w_all=[nu_w_all nu_w_curr('nu_w')];
end
plot(nu_w_all)
h =hline(nu_w,'r','The True Value');
```



Posterior Density of ν_w

```
histogram(nu_w_all)
```

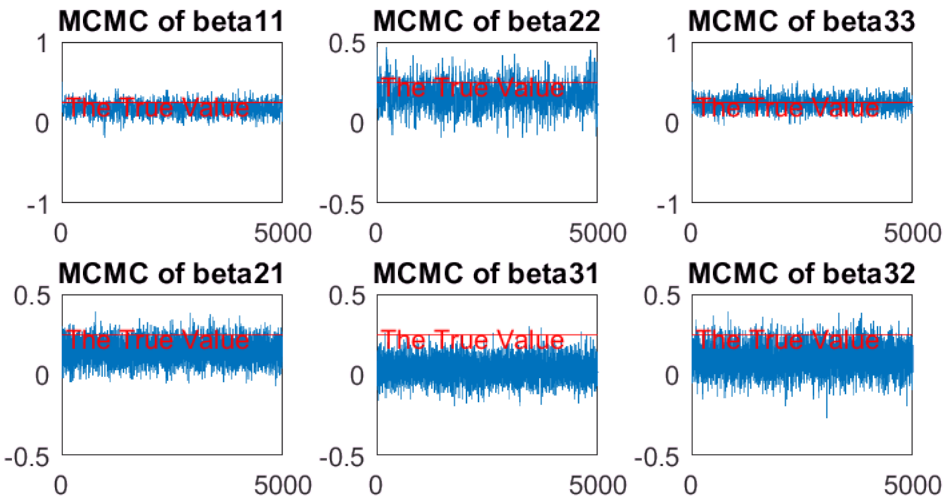


Spatially Varying Coefficents

MCMC of beta of voxel with signals

```
sg=randsample(signal_index,1);

figure
subplot(3,3,1)
beta_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta11');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0.25,'r','The True Value');
title('MCMC of beta11')

subplot(3,3,2)
beta_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta22');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0.25,'r','The True Value');
title('MCMC of beta22')

subplot(3,3,3)
beta_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta33');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0.25,'r','The True Value');
title('MCMC of beta33')

subplot(3,3,4)
beta_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta21');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0.25,'r','The True Value');
title('MCMC of beta21')

subplot(3,3,5)
beta_all=[];
```

```
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta31');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0.25,'r','The True Value');
title('MCMC of beta31')


subplot(3,3,6)
beta_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta32');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0.25,'r','The True Value');
title('MCMC of beta32')
```



MCMC of beta of voxel with non-signals

```
sg=randsample(setdiff(1:ndim,signal_index),1);
sg=125
```

```
sg = 125
```

```
figure
subplot(3,3,1)
beta_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta11');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0,'r','The True Value');
title('MCMC of beta11')

subplot(3,3,2)
beta_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta22');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0,'r','The True Value');
title('MCMC of beta22')

subplot(3,3,3)
beta_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta33');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0,'r','The True Value');
title('MCMC of beta33')

subplot(3,3,4)
beta_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta21');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0,'r','The True Value');
title('MCMC of beta21')

subplot(3,3,5)
beta_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta31');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0,'r','The True Value');
title('MCMC of beta31')
```

```
subplot(3,3,6)
beta_all=[];
for it=1:iters
    obj=Bookkeeping_MCMC{it};
    beta_curr=obj{4};
    my=beta_curr('beta32');
   beta_all=[beta_all my(sg,1)];
end
plot(beta_all)
h =hline(0,'r','The True Value');
title('MCMC of beta32')
```