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```
function Fsc = rsp_Fsc(chi_RSP)

if chi_RSP~=chi_RSP' | trace(chi_RSP)<max(eig(chi_RSP))
    error('Input matrix is not a process matrix of an unitary.')
end
```

```
Not enough input arguments.

Error in rsp_Fsc (line 3)
if chi_RSP~=chi_RSP' | trace(chi_RSP)<max(eig(chi_RSP))
```

define SDP parameters

define v_λ and ρ_λ

```
for i = 1:2
for j = 1:2
for k = 1:2

    v{i,j,k} = [i,j,k];
       rho_lambda{i,j,k} = sdpvar(2,2,'hermitian','complex');

end
end
end
```

define $p(v_{nm}|\lambda)$

```
for n=1:2
for m=1:3
```

```
for i=1:2
for j=1:2
for k=1:2
  P_lambda_vnm{i,j,k,n,m} = kronDel(n,v{i,j,k}(m));
end
end
end
end
end
```

define $\tilde{\rho}_{c|v_{nm}} = \sum_\lambda p(\lambda|v_{nm})\rho_\lambda$

```
for n=1:2
for m=1:3
  rho_rcs{n,m} = 0*sdpvar(2,2);
for i=1:2
for j=1:2
for k=1:2
  rho_rcs{n,m} = rho_rcs{n,m} +
 P_lambda_vnm{i,j,k,n,m}*rho_lambda{i,j,k};
end
end
end
end
end
```

construct $\tilde{\chi}_{\mathcal{E}_c}$

```
for i=1:2
for j=1:2

    rhoc{i,j}=0*sdpvar(2,2);

end
end


rhoc{1,1}=rho_rcs{1,3};
rhoc{1,2}=rho_rcs{1,1}+sqrt(-1)*rho_rcs{1,2}-
(1+sqrt(-1))*(rho_rcs{1,3}+rho_rcs{2,3})/2;
rhoc{2,1}=rho_rcs{1,1}-sqrt(-1)*rho_rcs{1,2}-(1-
sqrt(-1))*(rho_rcs{1,3}+rho_rcs{2,3})/2;
rhoc{2,2}=rho_rcs{2,3};


for i=1:2
    for j=1:2
        for k=1:2
            for l=1:2
                chi_Ec(i*2+j*1-2,k*2+l*1-2)=rhoc{i,k}(j,l);
            end
         end
    end
```

```
    end
```

constraits

```
F = [];
```

$\tilde{\rho}_\lambda \geq 0, \forall\lambda$

```
for i = 1:2
for j = 1:2
for k = 1:2
      F = [F, rho_lambda{i,j,k}>=0];
end
end
end
```

$\tilde{\chi}_{\mathcal{E}_c} \geq 0$

```
F = [F, chi_Ec >= 0];
```

$\mathrm{tr}(\tilde{\rho}_{c|v_{0m}}) = \mathrm{tr}(\tilde{\rho}_{c|v_{1m}}), \quad \forall m$

```
F =
 [F,trace(rho_lambda{1,1,1}+rho_lambda{1,1,2}+rho_lambda{1,2,1}+rho_lambda{1,2,2})
F =
 [F,trace(rho_lambda{1,1,1}+rho_lambda{1,1,2}+rho_lambda{2,1,1}+rho_lambda{2,1,2})
F =
 [F,trace(rho_lambda{1,1,1}+rho_lambda{1,2,1}+rho_lambda{2,1,1}+rho_lambda{2,2,1})
```

$\mathrm{tr}(\tilde{\chi}_{\mathcal{E}_c}) = 1$

```
Fc_t=[F ,  trace(chi_Ec) <= 1];
```

maximize $F_{\mathcal{E}_c} = \max_{\tilde{\chi}_{\mathcal{E}_c}} \quad \mathrm{tr}(\tilde{\chi}_{\mathcal{E}_c}\chi_{\mathrm{RSP}})$

```
sums=trace(chi_Ec*chi_RSP);


sol=solvesdp(Fc_t ,-1*sums)

Fc=double(sums);
Fsc=(2*Fc+1)/3; %convert process fidelity to average state fidelity
```

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