20231003_Correction_SimulationMC_TPO1TPE1

October 3, 2023

[1]:
```
import numpy as np
import matplotlib.pyplot as plt
```

[12]:
```
ia2=20
ip2=13
ia9=70
ip9=39.5
Dia2=1
Dip2=1
Dia9=1
Dip9=3
na=1.0003
Dna=np.sqrt(3.)*3e-4
N=int(1e7)
```

[13]:
```
def tab_alea(m,delta) :
    return np.random.uniform(m-delta,m+delta,N)
```

[23]:
```
tab_ia2=(np.pi/180)*tab_alea(ia2,Dia2)
tab_ip2=(np.pi/180)*tab_alea(ip2,Dip2)
tab_ia9=(np.pi/180)*tab_alea(ia9,Dia9)
tab_ip9=(np.pi/180)*tab_alea(ip9,Dip9)
tab_na=tab_alea(na,Dna)
```

[24]:
```
tab_np2=tab_na*np.sin(tab_ia2)/np.sin(tab_ip2)
tab_np9=tab_na*np.sin(tab_ia9)/np.sin(tab_ip9)
```

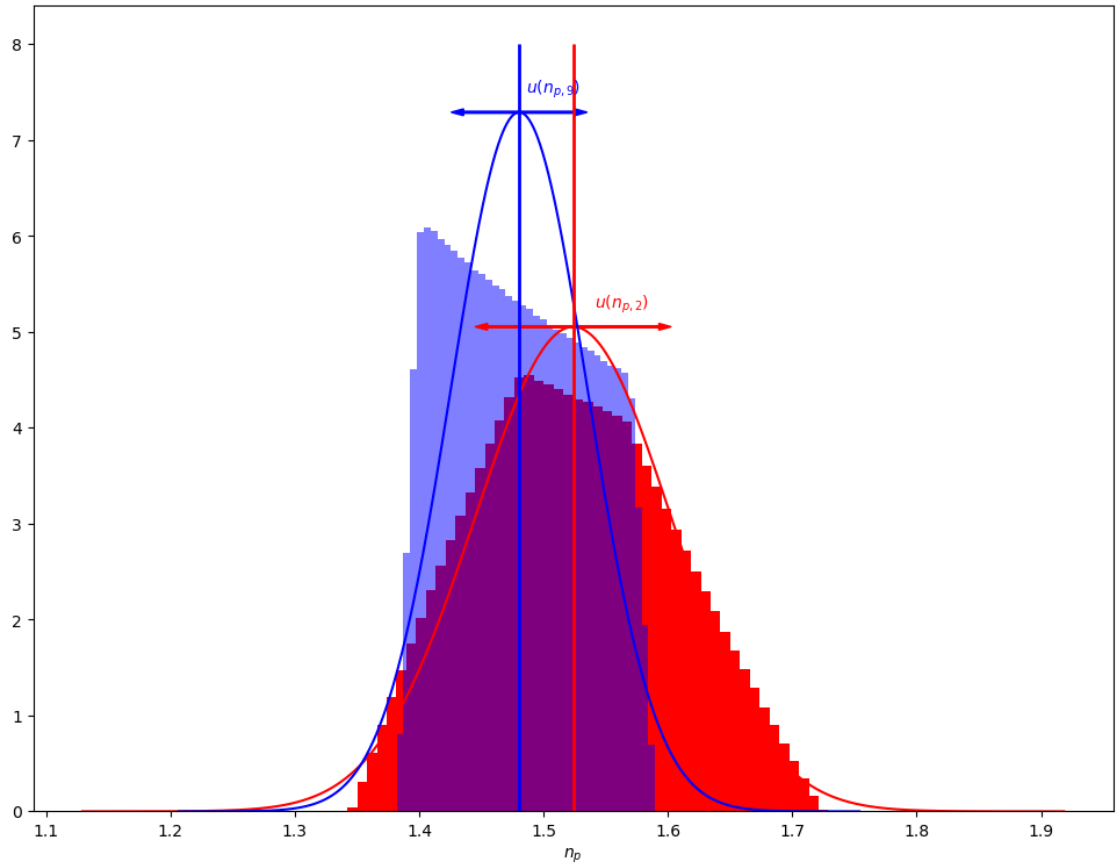
[25]:
```
np2=np.mean(tab_np2)
unp2=np.std(tab_np2,ddof=1)
np9=np.mean(tab_np9)
unp9=np.std(tab_np9,ddof=1)
tab_np2
```

[25]:
```
array([1.51071648, 1.62501485, 1.61448179, …, 1.56047792, 1.70123522,
       1.596715  ])
```

[26]:
```
def f_gauss(x,m,sigma) :
```

```
    return np.exp(-np.power(x-m,2)/(2*np.power(sigma,2)))/np.sqrt(2*np.pi*np.
 ↪power(sigma,2))
```

[54]:
```
fig,ax=plt.subplots(1,figsize=(12,9))
ax.hist(tab_np2,bins=100,range=[np2-5*unp2,np2+5*unp2],color='red',density=True)
ax.
 ↪hist(tab_np9,bins=100,range=[np9-5*unp9,np9+5*unp9],color='blue',density=True,alpha=0.
 ↪5)
temp_np2=np.linspace(np2-5*unp2,np2+5*unp2,1001)
temp_np9=np.linspace(np9-5*unp9,np9+5*unp9,1001)
ax.plot(temp_np2,f_gauss(temp_np2,np2,unp2),color='red')
ax.plot(temp_np9,f_gauss(temp_np9,np9,unp9),color='blue')
ax.vlines(x=np2,ymin=0,ymax=8,lw=2,color='red')
ax.vlines(x=np9,ymin=0,ymax=8,lw=2,color='blue')
ax.arrow(np2,1/np.sqrt(2*np.pi*unp2**2),unp2,0,color='red',width=0.
 ↪02,head_width=0.07,head_length=0.01,length_includes_head=True)
ax.arrow(np2,1/np.sqrt(2*np.pi*unp2**2),-unp2,0,color='red',width=0.
 ↪02,head_width=0.07,head_length=0.01,length_includes_head=True)
ax.arrow(np9,1/np.sqrt(2*np.pi*unp9**2),unp9,0,color='blue',width=0.
 ↪02,head_width=0.07,head_length=0.01,length_includes_head=True)
ax.arrow(np9,1/np.sqrt(2*np.pi*unp9**2),-unp9,0,color='blue',width=0.
 ↪02,head_width=0.07,head_length=0.01,length_includes_head=True)
ax.text(np2+0.5*unp2,1/np.sqrt(2*np.pi*unp2**2)+0.
 ↪2,'$u(n_{p,2})$',color='r',horizontalalignment='center')
ax.text(np9+.5*unp9,1/np.sqrt(2*np.pi*unp9**2)+0.
 ↪2,'$u(n_{p,9})$',color='b',horizontalalignment='center')
ax.set_xlabel('$n_p$')
plt.show()
```


$u(n_{p,9})$
$u(n_{p,2})$
8
7
6
5
4
3
2
1
0
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
n_p

[ ]: