traitement données de fork selon différentes définitions

In [2]:

```
import matplotlib.pyplot as plt
import numpy as np
```

In [31]:

```
#Import des données
data={}
name=["ghtorrent","swh","swh_rootdir","cliques_partition"]
for s in name:
    data[s]={}
    for ss in ["raw","cum"]:
        data[s][ss]={}
        with open(s+"_"+ss+".txt","r") as f:
            for line in f:
                x,y=line.split()
                data[s][ss][int(x)]=int(y)
        f.close()
#print(data)
```

In [32]:

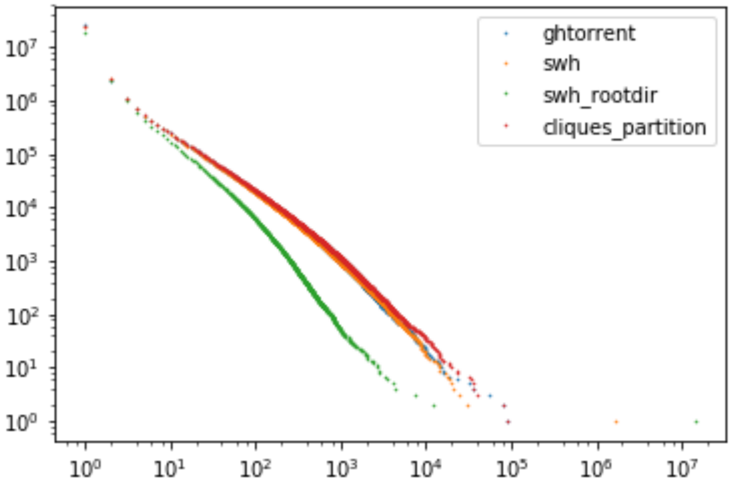
```
# check global properties
no=0
for s in name:
    y_sum=0
    xy_sum=0
    for x,y in data[s]["raw"].items():
        y_sum+=y
        xy_sum+=x*y
    print(s,"# components",y_sum,"# origins",xy_sum)
    no=max(no,xy_sum)
print("ok if # of origins are =",no)
```

```
ghtorrent # components 25309069 # origins 41451739
swh # components 24017112 # origins 41451739
swh_rootdir # components 18536077 # origins 41451739
cliques_partition # components 24063403 # origins 41450628
ok if # of origins are = 41451739
```

In [33]:

```
# affichage distribution cumulée des tailles des composants
for s in name:
    x=[]
    y=[]
    for key in sorted(data[s]["cum"].keys()):
        x.append(key)
        y.append(data[s]["cum"][key])
    plt.loglog(x,y,"o",markersize=0.6,label=s)
    print(x[0],y[0])
plt.legend()
plt.show()
```

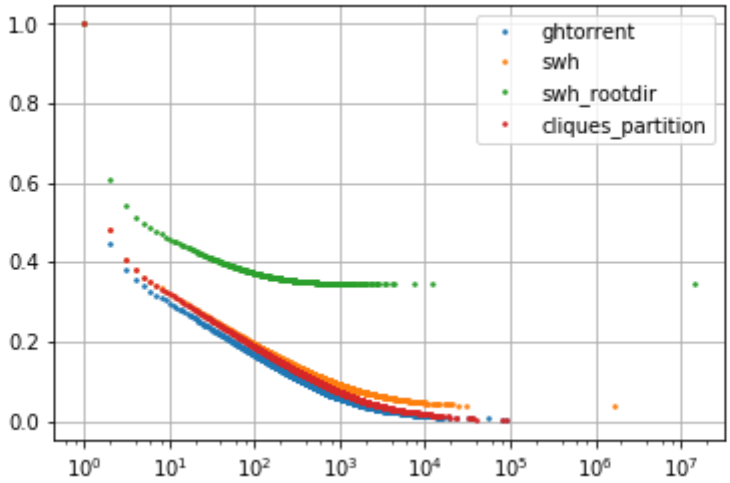
```
1 25309069
1 24017112
1 18536077
1 24063403
```



In [34]:

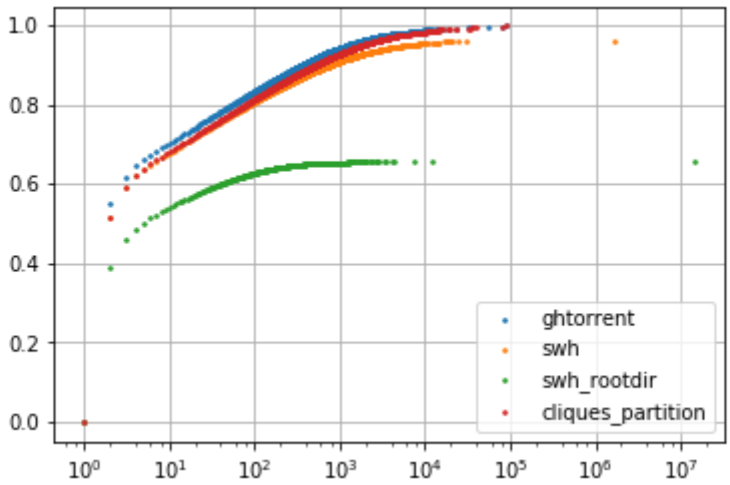
```
# affichage distribution cumulée des tailles des composants *
la taille (ie le nombre d'origines dans des composants de tai
lles)
for s in name:
    x=[]
    y=[]
    for key in sorted(data[s]["raw"].keys()):
        x.append(key)
        y.append(data[s]["raw"][key])
    xx=np.array(x)
    yy=np.array(y)
    yysum=np.zeros(len(y))
    # distribution cumulée de base
    for i in range(len(yysum)):
        yysum[i]=1*yy[i:].sum() # distribution non pondérée
(identique à cum)
        yysum[i]=(x[i:]*yy[i:]).sum() # distribution pondérée
    plt.semilogx(xx,yysum/no,"o",markersize=1.6,label=s)
    print(xx[0],yysum[0])
plt.grid()
plt.legend()
plt.show()
```

```
1 41451739.0
1 41451739.0
1 41451739.0
1 41450628.0
```



```
In [35]: # affichage distribution cumulée des tailles des composants *
         la taille (ie le nombre d'origines dans des composants de tai
         lles)
         for s in name:
             x=[]
             y=[]
             for key in sorted(data[s]["raw"].keys()):
                 x.append(key)
                 y.append(data[s]["raw"][key])
             xx=np.array(x)
             yy=np.array(y)
             yysum=np.zeros(len(y))
             # distribution cumulée de base
             for i in range(len(yysum)):
                 yysum[i]=1*yy[i:].sum() # distribution non pondérée
         (identique à cum)
                 yysum[i]=(x[i:]*yy[i:]).sum() # distribution pondérée
             plt.semilogx(xx,1-yysum/no,"o",markersize=1.6,label=s)
             print(xx[0],yysum[0])
         plt.grid()
         plt.legend()
         plt.show()
```

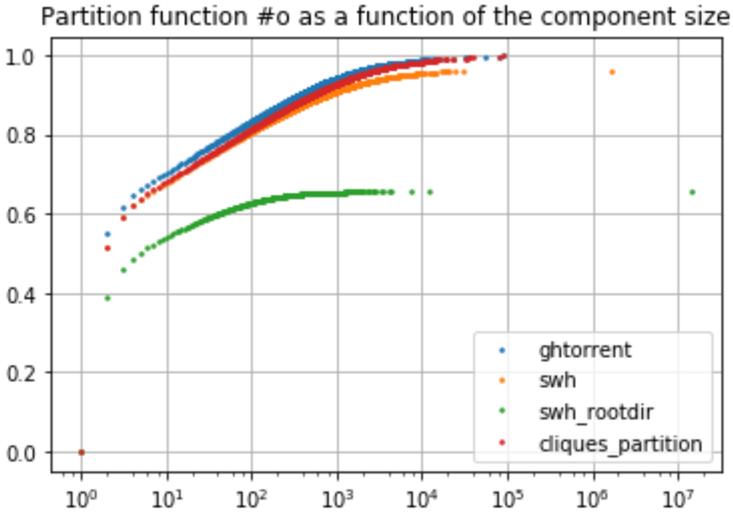
```
1 41451739.0
1 41451739.0
1 41451739.0
1 41450628.0
```

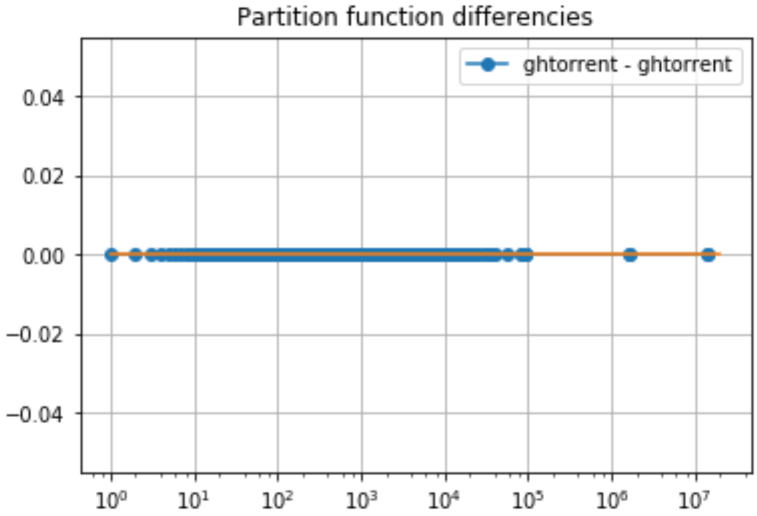


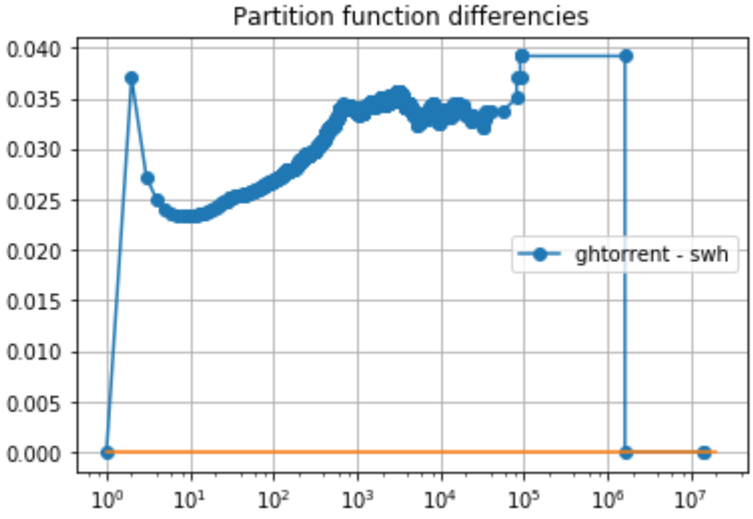
In [38]:

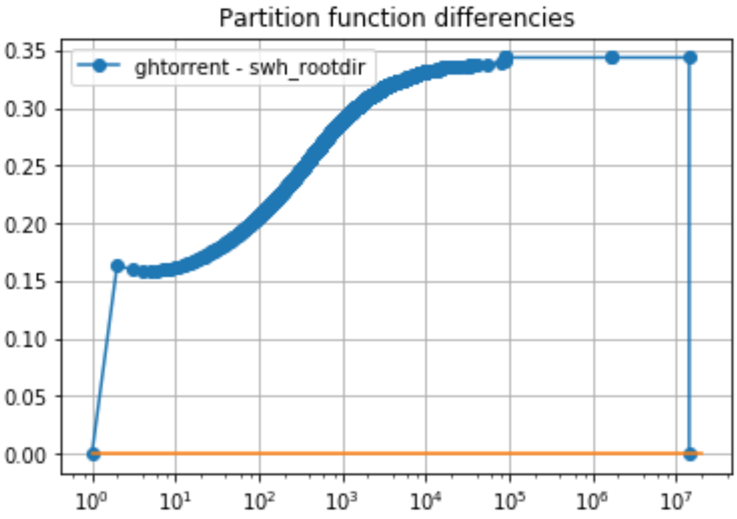
```
# on complete les histogrammes cumulées
#On crée une liste de toutes les valeurs de x
#puis on complete
# affichage distribution cumulée des tailles des composants * la taille (ie le nombre d'origines dans des composants de tailles)
yysum={}
xxsum={}
for s in name:
    x=[]
    y=[]
    for key in sorted(data[s]["raw"].keys()):
        x.append(key)
        y.append(data[s]["raw"][key])
    xx=np.array(x)
    yy=np.array(y)
    yysum[s]=np.zeros(len(y))
    xxsum[s]=xx
    # distribution cumulée de base
    for i in range(len(yysum[s])):
        yysum[s][i]=1*yy[i:].sum() # distribution non pondérée (identique à cum)
        yysum[s][i]=1-(xx[i:]*yy[i:]).sum()/no # distribution pondérée
    plt.semilogx(xxsum[s],yysum[s],"o",markersize=1.6,label=s)
    print(xx[0],yysum[s][0])
plt.grid()
plt.legend()
plt.title("Partition function #o as a function of the component size")
plt.show()
# liste des x complete
xxsum2={}
yysum2={}
for s in name:
    for i in range(len(xxsum[s])):
        x=xxsum[s][i]
        y=yysum[s][i]
        try:
            xxsum2[x][s]=1
        except:
            xxsum2[x]={s:1}
        try:
            yysum2[x][s]=y
        except:
            yysum2[x]={s:y}
    try:
        xxsum2[x+1][s]=1
        yysum2[x+1][s]=1
    except:
        xxsum2[x+1]={s:1}
        yysum2[x+1]={s:1}

#print(yysum2)
#on bouche les trous
default={}
for s in name:
```

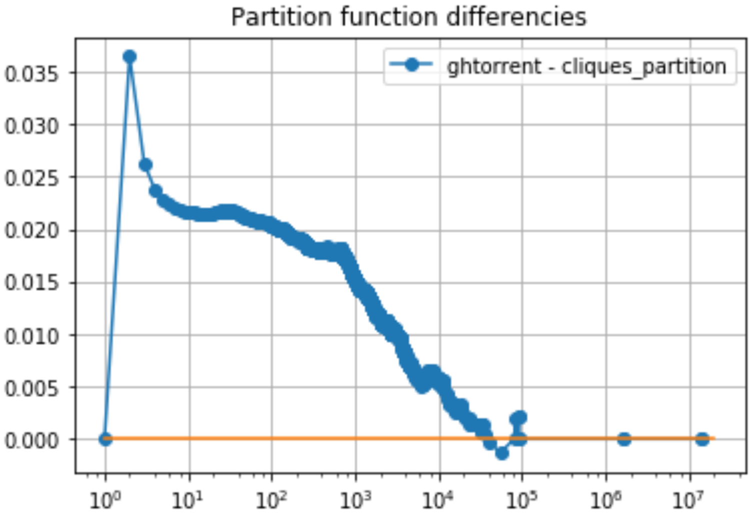
```
1 0.0
1 0.0
1 0.0
1 2.68022530973e-05
```







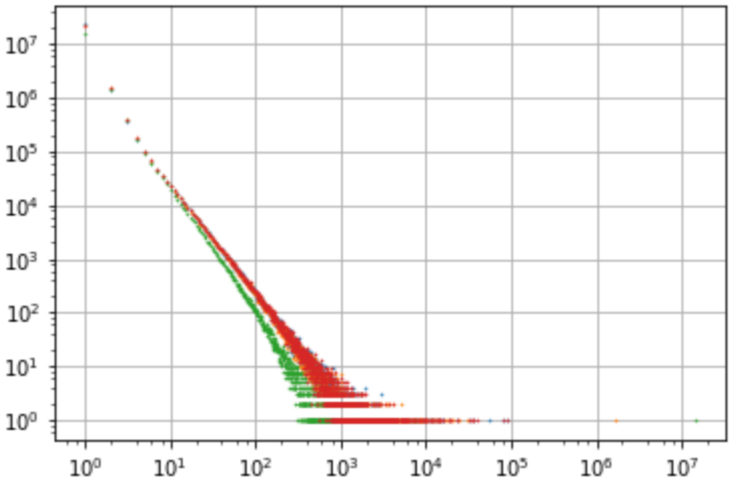

Partition function differencies
ghtorrent - swh_rootdir
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
10^0
10^1
10^2
10^3
10^4
10^5
10^6
10^7


Partition function differencies
ghtorrent - cliques_partition
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
10^0
10^1
10^2
10^3
10^4
10^5
10^6
10^7

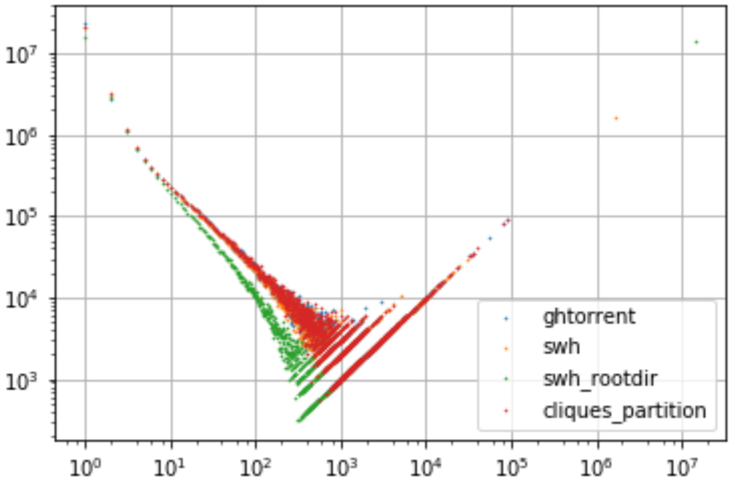
In [39]:

```
# affichage distributions BRUTES des tailles des composants
for s in name:
    x=[]
    y=[]
    for key in sorted(data[s]["raw"].keys()):
        x.append(key)
        y.append(data[s]["raw"][key])
    plt.loglog(x,y,"o",markersize=0.6)
    print(x[0],y[0])
plt.grid()
plt.show()
for s in name:
    x=[]
    y=[]
    for key in sorted(data[s]["raw"].keys()):
        x.append(key)
        y.append(data[s]["raw"][key]*key)
    plt.loglog(x,y,"o",markersize=0.6,label=s)
    print(x[0],y[0])
plt.grid()
plt.legend()
plt.show()
```

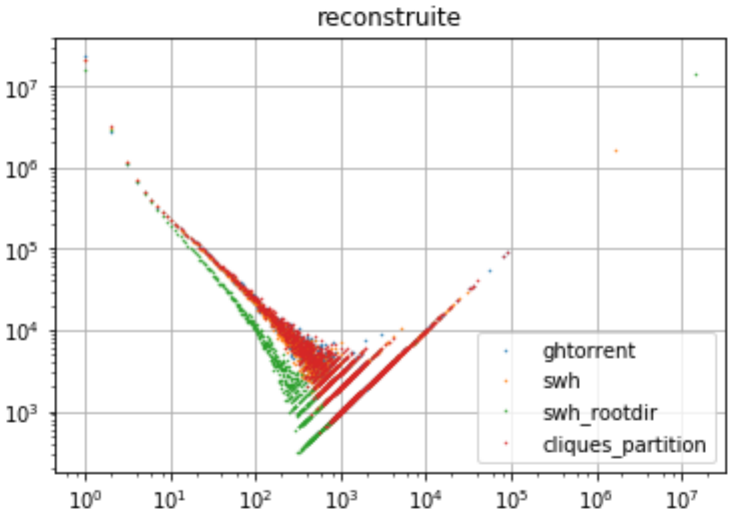
```
1 22906040
1 21372192
1 16131387
1 21394717
```



```
1 22906040
1 21372192
1 16131387
1 21394717
```



In [40]:
```
# distribution plot
for s in name:
    plt.loglog(xxsum3[0:len(xxsum3)-1],(yysum3[s][1:len(xxsum3)]-yysum3[s][0:len(xxsum3)-1])*no,"o",markersize=0.5,label=s)
plt.title("reconstruite")
plt.legend()
plt.grid()
plt.show()
```



In [41]:
```
print(xxsum3[len(xxsum3)-1])
print(xxsum3[len(xxsum3)-2])
```

```
14245628
14245627
```

In [42]:
```
for s in name:
    print(s,"-1",yysum3[s][len(xxsum3)-1])
    print(s,"-2",yysum3[s][len(xxsum3)-2])
```

```
ghtorrent -1 1.0
ghtorrent -2 1.0
swh -1 1.0
swh -2 1.0
swh_rootdir -1 1.0
swh_rootdir -2 0.656332222877
cliques_partition -1 1.0
cliques_partition -2 1.0
```

lien avec la distribution des tailles au sens de la définition ghtorrent, dans l'amas géant au sens de swh (revision) 20200106

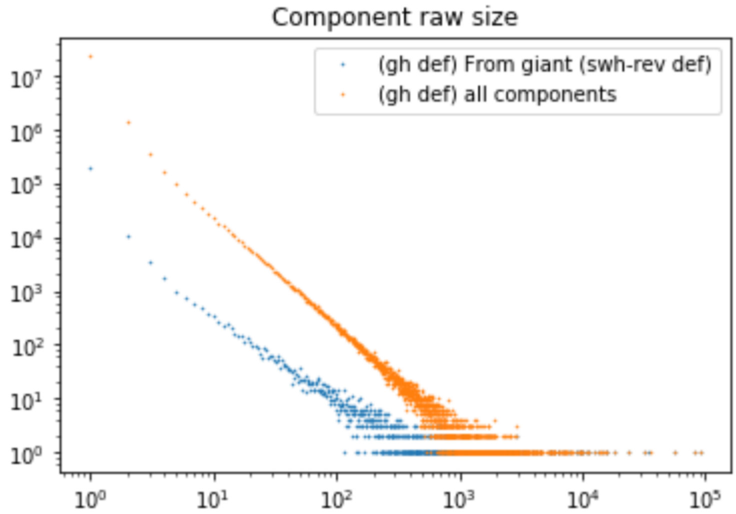
In [43]:

```
#Import des données
intersect={}
with open("intersect.txt","r") as f:
    for line in f:
        x,y=line.split()
        intersect[int(x)]=int(y)
f.close()
```

In [44]:

```
x=[]
y=[]
for key in sorted(intersect.keys()):
    x.append(key)
    y.append(intersect[key])
plt.loglog(x,y,"o",markersize=0.6,label="(gh def) From giant (swh-rev def)")
print(x[0],y[0])
plt.grid()
#plt.show()
print(name)
for s in ["ghtorrent"]:
    x=[]
    y=[]
    for key in sorted(data[s]["raw"].keys()):
        x.append(key)
        y.append(data[s]["raw"][key])
    plt.loglog(x,y,"o",markersize=0.6,label="(gh def) all components")
    print(x[0],y[0])
plt.grid()
plt.title("Component raw size")
plt.legend()
plt.show()
# show 1-Partition function (should be compared to "diff bewteen partition function")
# check size of the giant component
y_sum=0
xy_sum=0
for x,y in intersect.items():
    y_sum+=y
    xy_sum+=x*y
print(s,"# components",y_sum,"# origins",xy_sum)
print("ok if # of origins are =",max(data["swh"]["cum"].keys()))
```

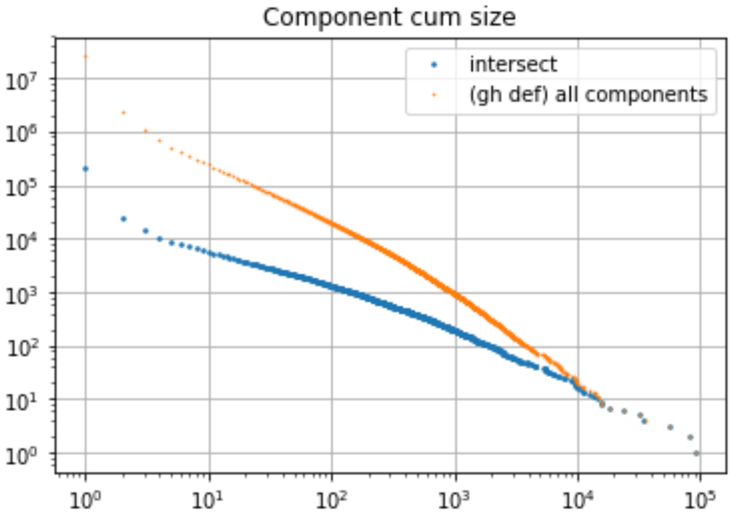
```
1 190762
['ghtorrent', 'swh', 'swh_rootdir', 'cliques_partition']
1 22906040
```



```
ghtorrent # components 215606 # origins 1624226
ok if # of origins are = 1624226
```

In [45]:

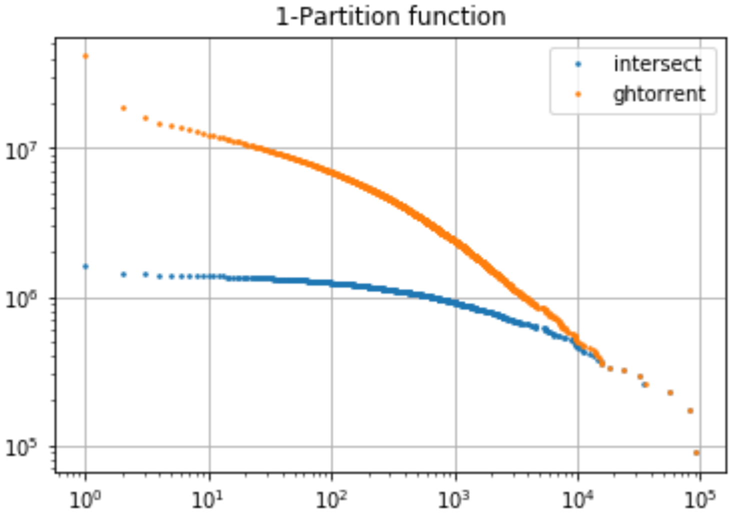
```
# affichage distribution cumulée des tailles des composants * la taille (ie le nombre d'origines dans des composants de tailles)
x=[]
y=[]
for key in sorted(intersect.keys()):
    x.append(key)
    y.append(intersect[key])
xx=np.array(x)
yy=np.array(y)
yysum=np.zeros(len(y))
# distribution cumulée de base
for i in range(len(yysum)):
        yysum[i]=1*yy[i:].sum() # distribution non pondérée (identique à cum)
        #yysum[i]=(x[i:]*yy[i:]).sum() # distribution pondérée
plt.loglog(xx,yysum,"o",markersize=1.6,label="intersect")

for s in ["ghtorrent"]:
    x=[]
    y=[]
    for key in sorted(data[s]["cum"].keys()):
        x.append(key)
        y.append(data[s]["cum"][key])
    plt.loglog(x,y,"o",markersize=0.6,label="(gh def) all components")
plt.grid()
plt.title("Component cum size")
plt.legend()
plt.show()
```



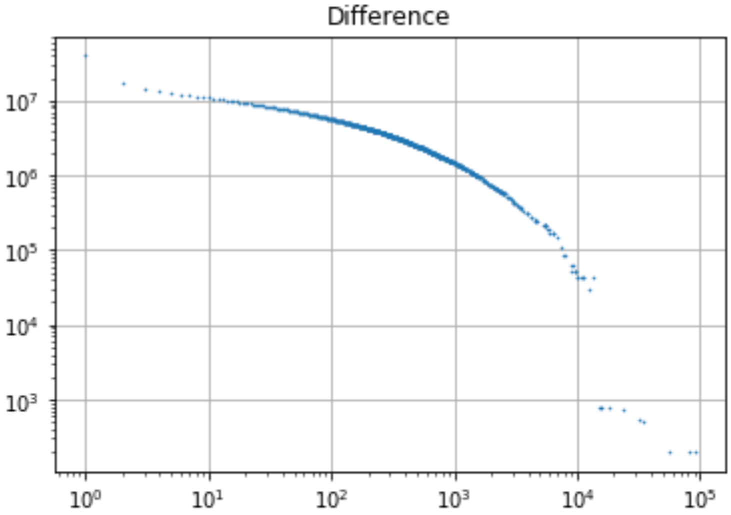
In [46]:

```
# Same with weighted, normalization, and diff
# affichage distribution pondérée cumulée des tailles des com
posants * la taille (ie le nombre d'origines dans des composa
nts de tailles)
x=[]
y=[]
for key in sorted(intersect.keys()):
    x.append(key)
    y.append(intersect[key])
xx=np.array(x)
yy=np.array(y)
yysum=np.zeros(len(y))
# distribution cumulée de base
for i in range(len(yysum)):
        #yysum[i]=1*yy[i:].sum() # distribution non pondérée
(identique à cum)
        yysum[i]=(x[i:]*yy[i:]).sum() # distribution pondérée
print(xx[0],yysum[0])
#no=yysum[0]
plt.loglog(xx,yysum,"o",markersize=1.6,label="intersect")

for s in ["ghtorrent"]:
    xref=[]
    yref=[]
    for key in sorted(data[s]["raw"].keys()):
        xref.append(key)
        yref.append(data[s]["raw"][key])
    xxref=np.array(xref)
    yyref=np.array(yref)
    yysumref=np.zeros(len(yref))
    # distribution cumulée de base
    for i in range(len(yysumref)):
        #yysumref[i]=1*yyref[i:].sum() # distribution non pon
dérée (identique à cum)
        yysumref[i]=(xref[i:]*yyref[i:]).sum() # distribution
pondérée
    plt.semilogx(xxref,yysumref,"o",markersize=1.6,label=s)
    print(xxref[0],yysumref[0])
plt.grid()
plt.title("1-Partition function")
plt.legend()
plt.show()


print(len(yysum),len(yysumref))
# diff where xxref exist
# xx ref value from intersect
# yysum truncated
xdiff=[]
ydiff=[]
for i in range(len(xx)):
    # find iref corresponding to xx[i] in xxref (ie xxref[ire
f]=xx[i])
    iref=np.where(xxref>=xx[i])[0].min()
    #print(i,iref[0].min())
    xdiff.append(xx[i])
    #ydiff.append((yysumref[iref]-yysum[i])/yysumref[iref])
    ydiff.append((yysumref[iref]-yysum[i]))
```

```
1 1624226.0
1 41451739.0
```



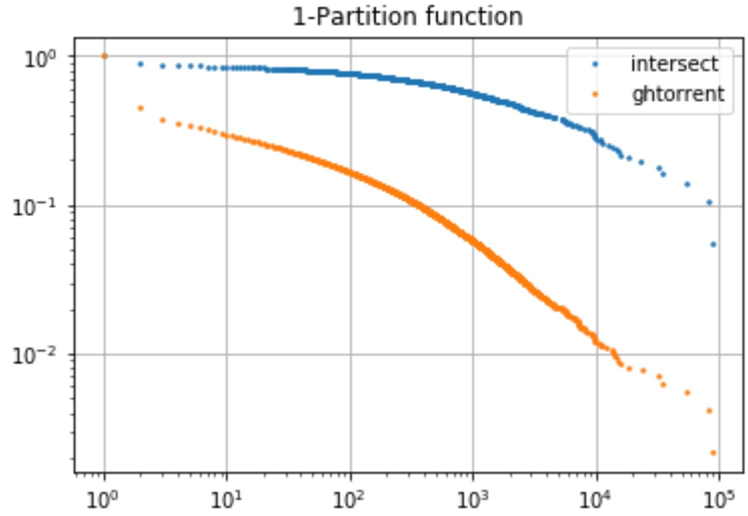
```
744 1684
```



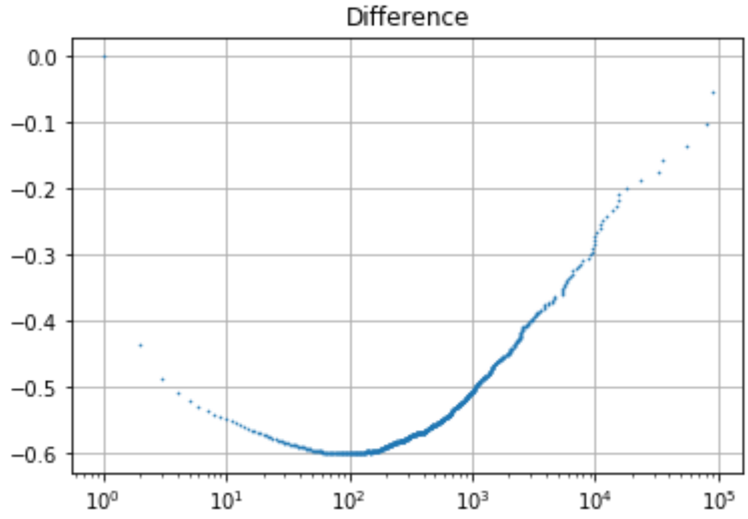
In [47]:

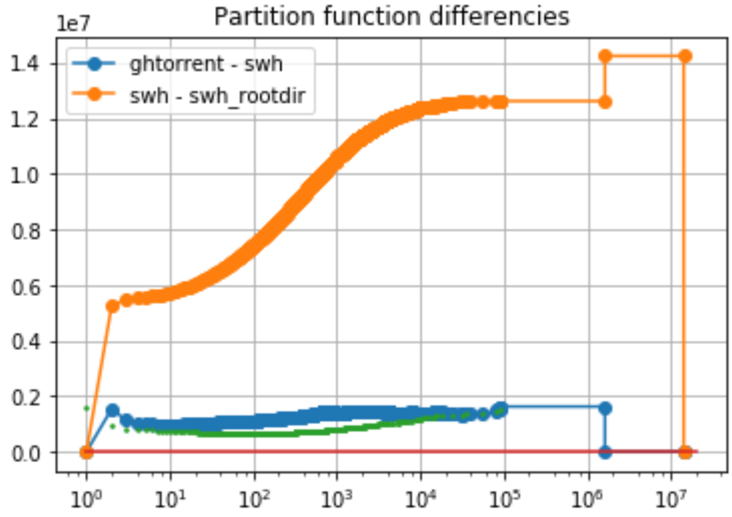
```
# Same with weighted, normalization, and diff
# affichage distribution pondérée cumulée des tailles des composants * la taille (ie le nombre d'origines dans des composants de tailles)
x=[]
y=[]
for key in sorted(intersect.keys()):
    x.append(key)
    y.append(intersect[key])
xx=np.array(x)
yy=np.array(y)
yysum=np.zeros(len(y))
# distribution cumulée de base
for i in range(len(yysum)):
        #yysum[i]=1*yy[i:].sum() # distribution non pondérée (identique à cum)
        yysum[i]=(x[i:]*yy[i:]).sum() # distribution pondérée
print(xx[0],yysum[0])
#no=yysum[0]
plt.loglog(xx/xx[0],yysum/yysum[0],"o",markersize=1.6,label="intersect")

for s in ["ghtorrent"]:
    xref=[]
    yref=[]
    for key in sorted(data[s]["raw"].keys()):
        xref.append(key)
        yref.append(data[s]["raw"][key])
    xxref=np.array(xref)
    yyref=np.array(yref)
    yysumref=np.zeros(len(yref))
    # distribution cumulée de base
    for i in range(len(yysumref)):
        #yysumref[i]=1*yyref[i:].sum() # distribution non pondérée (identique à cum)
        yysumref[i]=(xref[i:]*yyref[i:]).sum() # distribution pondérée
    plt.semilogx(xxref/xxref[0],yysumref/yysumref[0],"o",markersize=1.6,label=s)
    print(xxref[0],yysumref[0])
plt.grid()
plt.title("1-Partition function")
plt.legend()
plt.show()


# coeff is ratio
ratio=yysum[0]/yysumref[0]

print(len(yysum),len(yysumref))
# diff where xxref exist
# xx ref value from intersect
# yysum truncated
xdiff=[]
ydiff=[]
for i in range(len(xx)):
    # find iref corresponding to xx[i] in xxref (ie xxref[iref]=xx[i])
```

```
1 1624226.0
1 41451739.0
```



```
744 1684
```



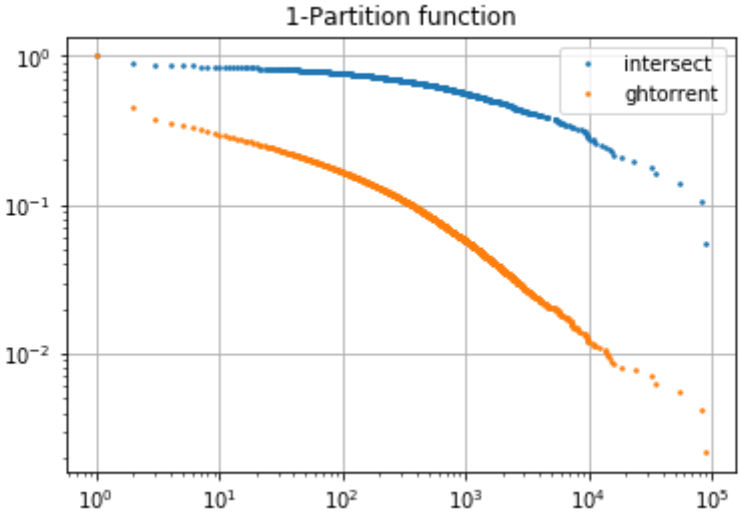


not yet convincing (still probleme in normalisation definition - solved in he next section)

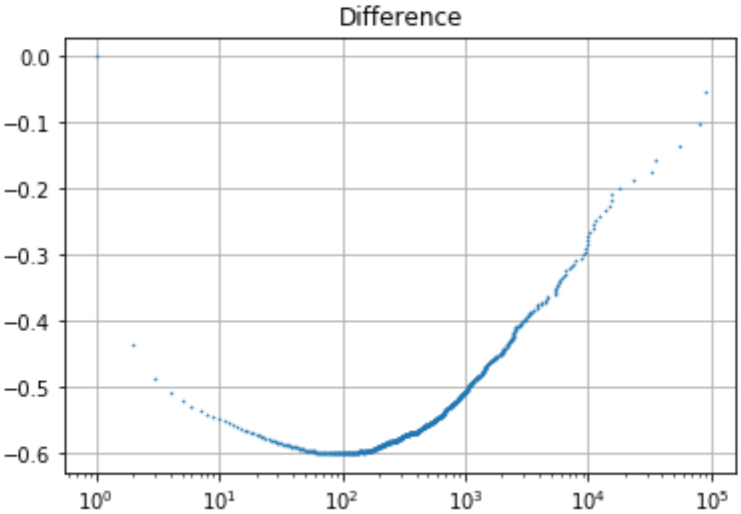
In [18]:

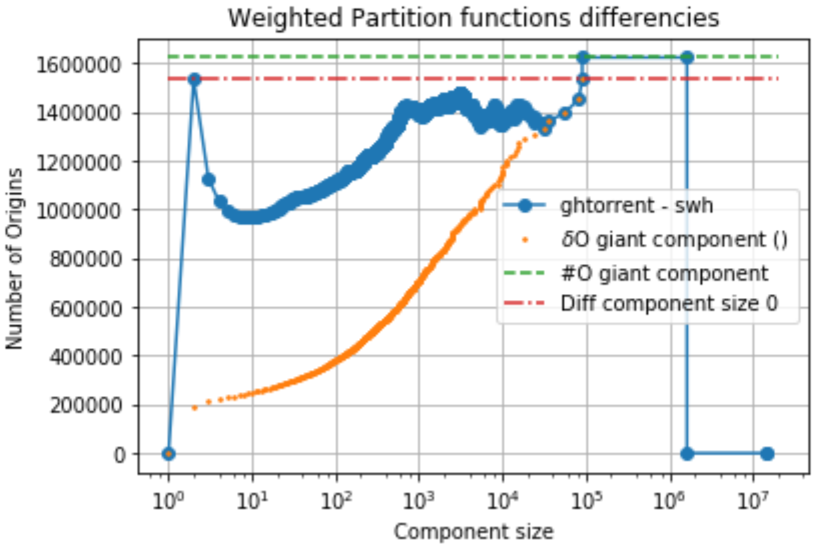
```
# Same with weighted, normalization, and diff
# affichage distribution ponderée cumulée des tailles des com
posants * la taille (ie le nombre d'origines dans des composa
nts de tailles)
x=[]
y=[]
for key in sorted(intersect.keys()):
    x.append(key)
    y.append(intersect[key])
xx=np.array(x)
yy=np.array(y)
yysum=np.zeros(len(y))
# distribution cumulée de base
for i in range(len(yysum)):
        #yysum[i]=1*yy[i:].sum() # distribution non pondérée
(identique à cum)
        yysum[i]=(x[i:]*yy[i:]).sum() # distribution pondérée
print(xx[0],yysum[0])
#no=yysum[0]
plt.loglog(xx/xx[0],yysum/yysum[0],"o",markersize=1.6,label="
intersect")

for s in ["ghtorrent"]:
    xref=[]
    yref=[]
    for key in sorted(data[s]["raw"].keys()):
        xref.append(key)
        yref.append(data[s]["raw"][key])
    xxref=np.array(xref)
    yyref=np.array(yref)
    yysumref=np.zeros(len(yref))
    # distribution cumulée de base
    for i in range(len(yysumref)):
        #yysumref[i]=1*yyref[i:].sum() # distribution non pon
dérée (identique à cum)
        yysumref[i]=(xref[i:]*yyref[i:]).sum() # distribution
pondérée
    plt.semilogx(xxref/xxref[0],yysumref/yysumref[0],"o",mark
ersize=1.6,label=s)
    print(xxref[0],yysumref[0])
plt.grid()
plt.title("1-Partition function")
plt.legend()
plt.show()


# coeff is ratio
ratio=yysum[0]/yysumref[0]

print(len(yysum),len(yysumref))
# diff where xxref exist
# xx ref value from intersect
# yysum truncated
xdiff=[]
ydiff=[]
for i in range(len(xx)):
    # find iref corresponding to xx[i] in xxref (ie xxref[ire
f]=xx[i])
```

```
1 1624226.0
1 41451739.0
```



```
744 1684
```





diff entre ghtorrent et swh pour les composants de taille 1 (1 533 848 origines) taille de l'amas géant 1624226

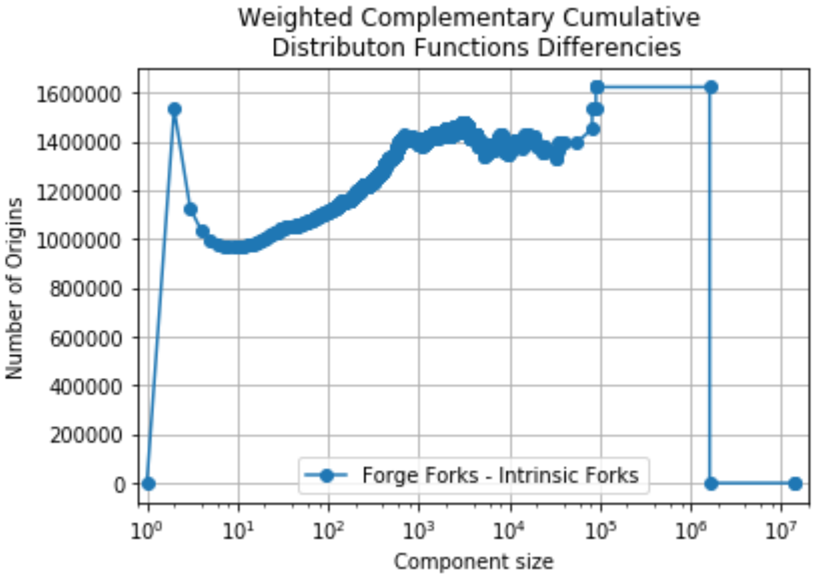
20200114 TODO

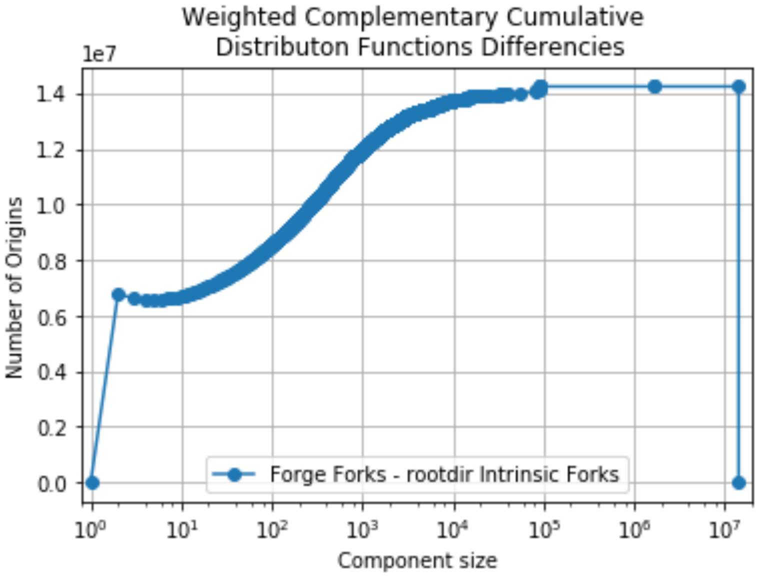
```
partage des notebooks (fait)

liste des figures / section Results

    (1) flux entre gh et swh-rev (DONE)

    (2) flux entre gh et swh-rootdir (DONE)

    (3) flux entre gh et swh-cliques (+partition) (DONE ! bug (~1 100 origines missing)

    (4) Distribution des tailles des composants au sens gh des origines de l'amas geants au sens swh-rev (

    (5) Distribution des tailles des composants au sens gh des origines de l'amas geants au sens swh-rootdir

    (6) Distribution des tailles des composants au sens gh des origines de l'amas geants au sens swh-rootdir

    (7) synthese  (1) et (Flux de 4) pour discussion (gh-swhrev)

Export des données et images  (DONE)
Discussion
```

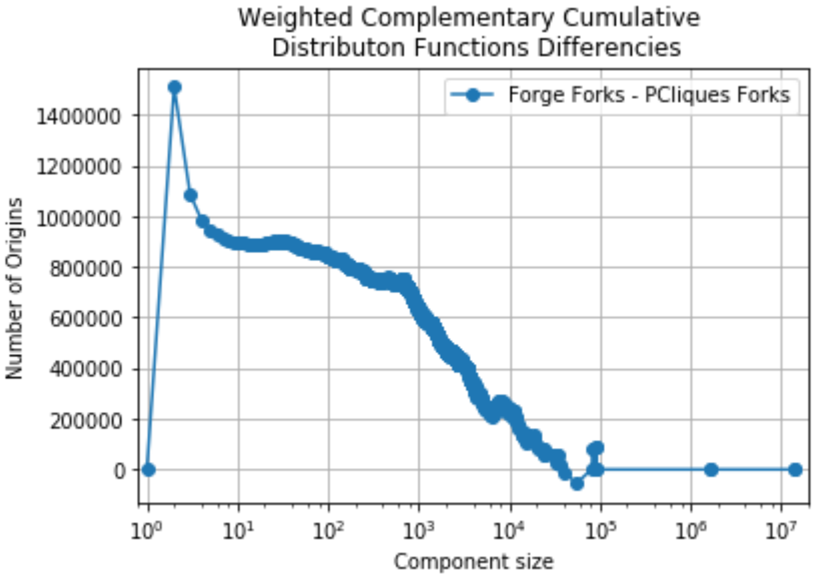
In [56]:

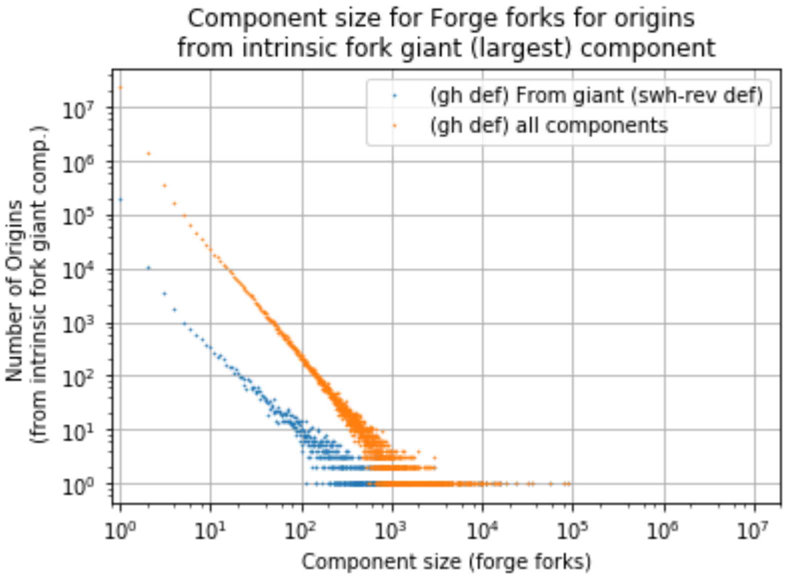
```
#Fig 1 : flux entre gh et swh-rev
print(name)
# ['ghtorrent', 'swh', 'swh_rootdir']
# on utiliser #1-#0
i=1
plt.semilogx(xxsum3,yysumref[0]*(yysum3[name[0]]-yysum3[name[i]]),"o-",label="Forge Forks - Intrinsic Forks")
plt.title("Weighted Complementary Cumulative \n Distributon Functions Differencies")
plt.xlabel("Component size")
plt.ylabel("Number of Origins")
plt.legend()
plt.grid()
plt.xlim([0.8,2e7])
plt.savefig("Diff_WCCDF_gh-swhrev.png")
plt.show()

#Fig 2 : flux entre gh et swh-rootdir
i=2
plt.semilogx(xxsum3,yysumref[0]*(yysum3[name[0]]-yysum3[name[i]]),"o-",label="Forge Forks - rootdir Intrinsic Forks")
plt.title("Weighted Complementary Cumulative \n Distributon Functions Differencies")
plt.xlabel("Component size")
plt.ylabel("Number of Origins")
plt.legend()
plt.grid()
plt.savefig("Diff_WCCDF_gh-swhrootdir.png")
plt.xlim([0.8,2e7])
plt.show()

#Fig 3 : flux entre gh et cliques_partition
i=3
plt.semilogx(xxsum3,yysumref[0]*(yysum3[name[0]]-yysum3[name[i]]),"o-",label="Forge Forks - PCliques Forks")
plt.title("Weighted Complementary Cumulative \n Distributon Functions Differencies")
plt.xlabel("Component size")
plt.ylabel("Number of Origins")
plt.legend()
plt.grid()
plt.savefig("Diff_WCCDF_gh-swhrootdir.png")
plt.xlim([0.8,2e7])
plt.show()

#Fig 4 : Distribution gh component size / origins from giant component
x=[]
y=[]
for key in sorted(intersect.keys()):
    x.append(key)
    y.append(intersect[key])
plt.loglog(x,y,"o",markersize=0.6,label="(gh def) From giant (swh-rev def)")
for s in ["ghtorrent"]:
    x=[]
    y=[]
    for key in sorted(data[s]["raw"].keys()):
```

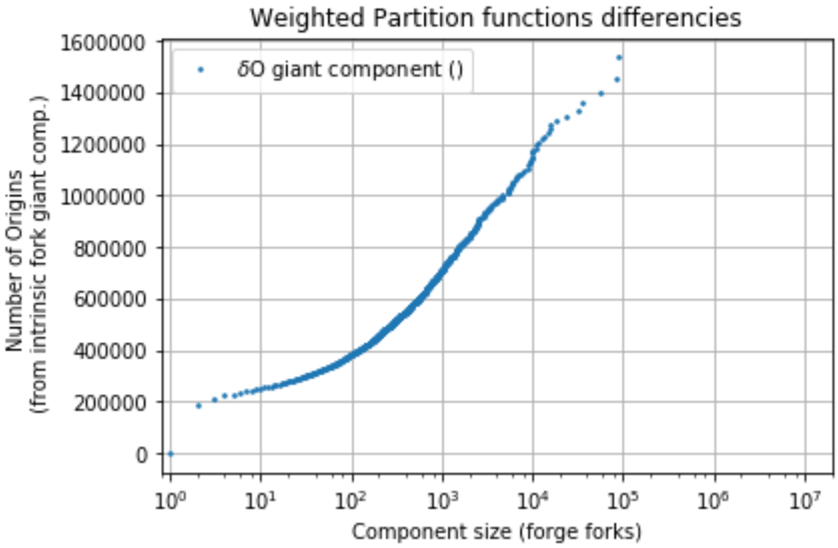
```
['ghtorrent', 'swh', 'swh_rootdir', 'cliques_partition']
```

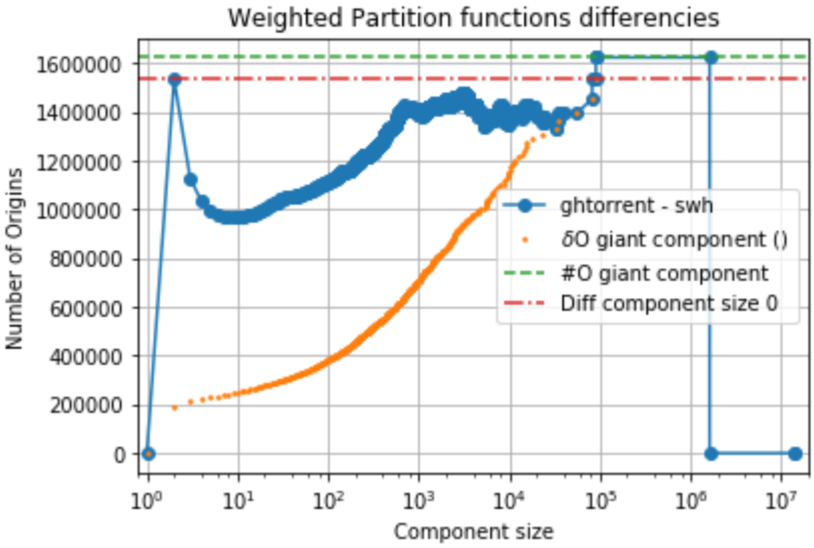







Component size for Forge forks for origins
from intrinsic fork giant (largest) component
(gh def) From giant (swh-rev def)
(gh def) all components
Number of Origins
(from intrinsic fork giant comp.)
10^0
10^1
10^2
10^3
10^4
10^5
10^6
10^7
Component size (forge forks)


Weighted Partition functions differencies
δO giant component ()
Number of Origins
(from intrinsic fork giant comp.)
1600000
1400000
1200000
1000000
800000
600000
400000
200000
0
10^0
10^1
10^2
10^3
10^4
10^5
10^6
10^7
Component size (forge forks)


Weighted Partition functions differencies
ghtorrent - swh
δO giant component ()
#O giant component
Diff component size 0
Number of Origins
1600000
1400000
1200000
1000000
800000
600000
400000
200000
0
10^0
10^1
10^2
10^3
10^4
10^5
10^6
10^7
Component size

```
In [ ]:
```