Tracé des vecteurs vitesse (version avec fonctions)

In [1]:

```python
import matplotlib.pyplot as plt
%matplotlib inline
import csv
```

In [2]:

```python
def charge_fichier_csv(fichier):
    with open(fichier, "r", encoding='utf-8') as f:
        rfichier = csv.reader(f, delimiter=";")
        tableau=[]
        for row in rfichier:
            if row[0][0] not in ("0","1","2","3","4","5","6","7",
                                 "8","9",",","."):
                continue
            for i in range (len(row)):
                X = []
                tableau.append(X)
                tableau[i].append(float(row[i].replace(",",'.')))
            break
        for row in rfichier:
            for i in range (len(row)):
                tableau[i].append(float(row[i].replace(",",'.')))
    return tableau
```

In [3]:

```python
def vitesse(t,z):
    vz=[]
    for i in range (1,len(z)-1):
        vzi=(z[i+1]-z[i-1])/(t[i+1]-t[i-1])
        vz.append(vzi)
    return vz
```

In [4]:

```python
def graphvect(x,y,vx,vy):
    fig = plt.figure(1,figsize=(12,10))
    plt.plot(x,y,'ro-')
    plt.xlim(0,max(x)+0.5)
    plt.ylim(0,max(y)+0.5)
    plt.grid()
    plt.xlabel("x(m)")
    plt.ylabel("y(m)")
    for i in range (len (vx)) :
        plt.arrow(x[i+1],y[i+1],0.05*vx[i],0.05*vy[i],fc='b',
                  ec='b',head_width=0.02,
                  length_includes_head=True)
    plt.title("Tracé des vecteurs vitesse instantanée")
    plt.show()
```

1

```
tableau = charge_fichier_csv("chute balle.csv")
t=tableau[0]
print(t)
x=tableau[1]
print(x)
y=tableau[2]
print(y)
vx=vitesse(t,x)
vy=vitesse(t,y)
graphvect(x,y,vx,vy)
```

[0.76, 0.8, 0.84, 0.88, 0.92, 0.96, 1.0, 1.04, 1.08, 1.12, 1.16, 1.2, 1.24, 1.28, 1.32, 1.36]
[0.00865710739046, 0.106770991149, 0.204884874908, 0.302998758666, 0.398226939961, 0.493455121256, 0.588683302551, 0.675254376456, 0.767596855287, 0.857053631656, 0.946510408024, 1.03019577946, 1.11676685337, 1.19756652235, 1.27836619132, 1.36205156277]
[1.98247759242, 1.97093478256, 1.94496346039, 1.89590651851, 1.83530676678, 1.7545070978, 1.66216461897, 1.55827933028, 1.43707982682, 1.29568040611, 1.15139528293, 0.984024540049, 0.807996689776, 0.605997517332, 0.403998344888, 0.187570660127]

Tracé des vecteurs vitesse instantanée