

```

In [4]: #draw random sample from an exponential PDF
        %matplotlib inline
        import numpy as np
        import matplotlib.pyplot as plt
        import matplotlib
        matplotlib.rc('xtick', labels=12)
        matplotlib.rc('ytick', labels=12)

        #parameter of the exponential density
        h = 0.2

        #define the density function
        def exponential(x,h):
            return 1./h*np.exp(-x/h)

        #draw 1000 random samples
        N = 1000

        #rejection sampling
        i = 0
        k = 0
        x = np.zeros((N,1))
        while i<N:
            x0 = np.random.uniform(0,5.)
            y0 = np.random.rand()/h
            y1 = exponential(x0,h)
            if y0<=y1:
                x[i] = x0
                i += 1
            k += 1

        # analyze the samples in histogram
        xgrid = np.arange(0,5,0.1)
        xcenter = (xgrid[0:-1]+xgrid[1:])/2.
        hx,xedge = np.histogram(x,xgrid)

        #calculate the density function analytically
        y = exponential(xcenter,h)

        #draw histogram and compare with the analytic density curve
        fig = plt.figure(figsize=[10,5])
        ax = fig.add_subplot(111)
        ax.plot(xcenter,hx,'ko')
        ax.plot(xcenter,y/np.sum(y)*sum(hx),'r--')
        fig.show()

        print N/np.float(k)

```

0.0419304792654

