Paper: VEXPA: Validated EXPonential Analysis through regular sub-sampling.pdf

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Example Figure 4.

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Script environment

This script does not depend on the random number generator state.

```
clear
close all
```

Example Figure 4.

In Figure 4 we graphically sketch what happens. There $u = 9$, the elements in U_i are shown using blue circles, $s = 4$, the elements in S_i are shown using green squares and the arrow points to the unique non-aliased λ_i in their intersection. The orange portion is the region where the aliased ${}_u\lambda_i$ lies (red square), from which we have to recover the correct λ_i, the aliasing being the consequence of the decimation of the collected samples by a factor u.

```
mu = 6.4*pi*1i;
r = 0.1;

u = 9;
s = 4;
Ui = exp(mu*r+2*pi*1i/u*(0:u-1));
Si = exp(mu*r+2*pi*1i/s*(0:s-1));

plot_unit_circle
hold on
plot(Ui,'bo','MarkerSize',10,'LineWidth',1.5)
plot(Si,'gs','MarkerSize',10,'LineWidth',2)
plot(Ui([1,7]),'rs','MarkerSize',20,'LineWidth',3)
t = linspace(-pi/9,pi/9,100);
```

```
plot(polyshape([0,cos(t),0],[0,sin(t),0]),'FaceColor',[1,0.5,0])
quiver(real(Ui(7)),imag(Ui(7)),real(Ui(1)-Ui(7)),...
       imag(Ui(1)-Ui(7)),'Color','k','LineWidth',2,...
       'MaxHeadSize',0.5)
title({['Figure 4. Intersection of U_i (blue circles, u=9) '...
        'and S_i (green'], ['squares, s=4), relocating the '...
        'aliased _u\lambda_i (red square).']})
```

Figure 4. Intersection of U_i (blue circles, u=9) and S_i (green squares, s=4), relocating the aliased ${}_u\lambda_i$ (red square).