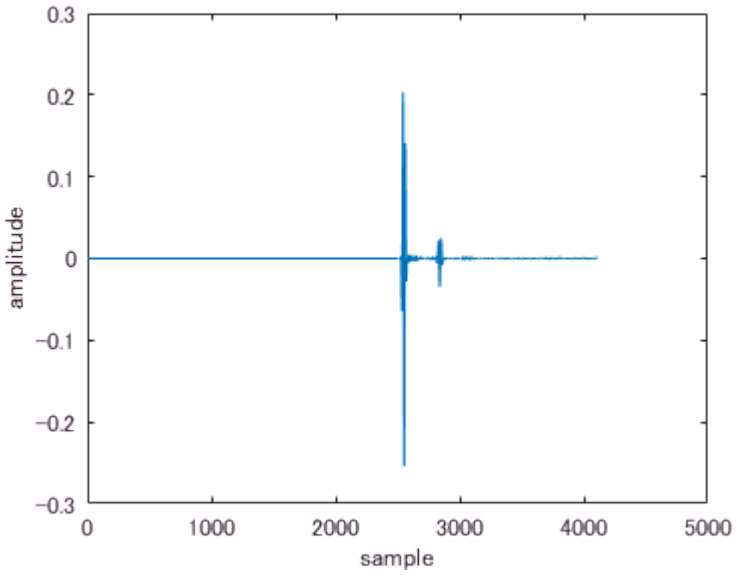
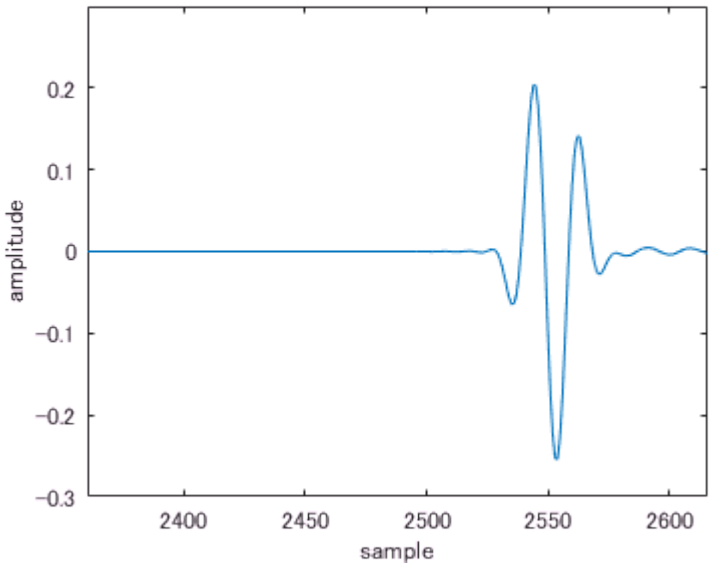
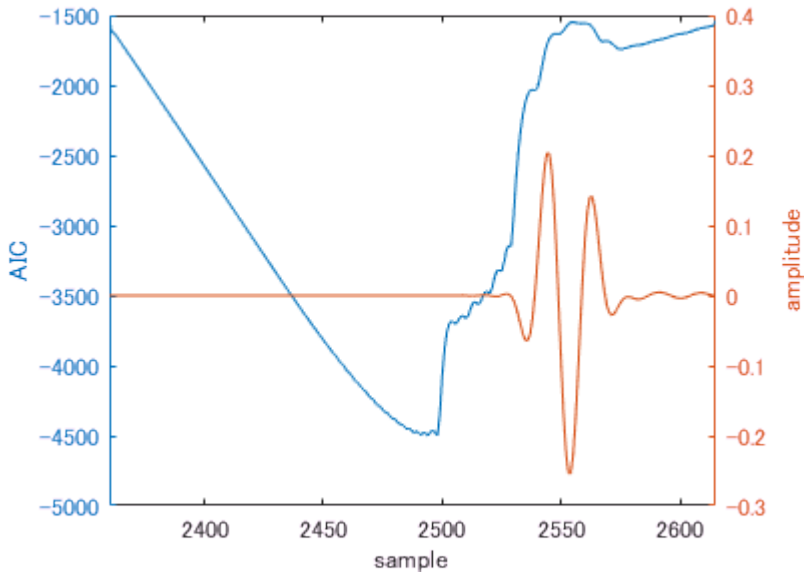
```
wave = rfdata(:,100,1);
figure;
plot(wave);
xlabel('sample')
ylabel('amplitude')
exportfig('../result/2018_02_20_test_wave_kwave_ring_object','png',[400,300]);
```



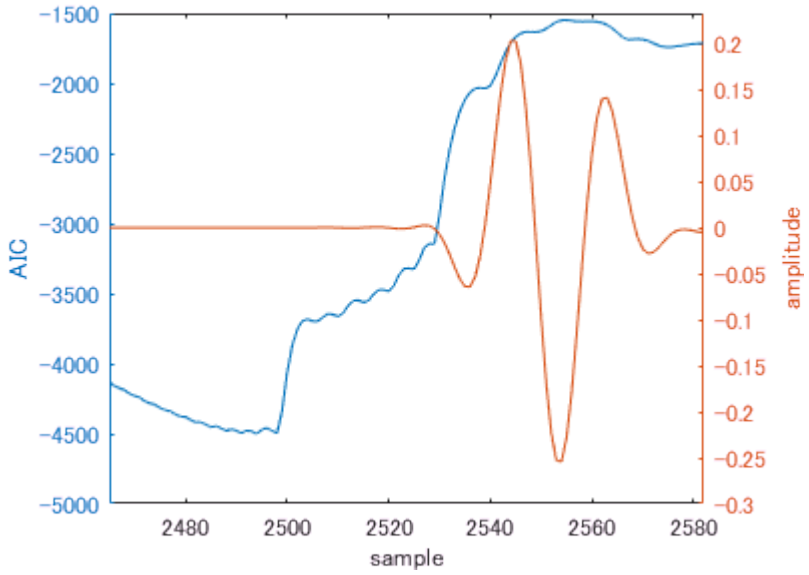

```
figure;
plot(wave);
xlim([2360 2616])
ylim([-0.300 0.300])
xlabel('sample')
ylabel('amplitude')
exportfig('../result/2018_02_20_test_wave2_kwave_ring_object','png',[400,300]);
```



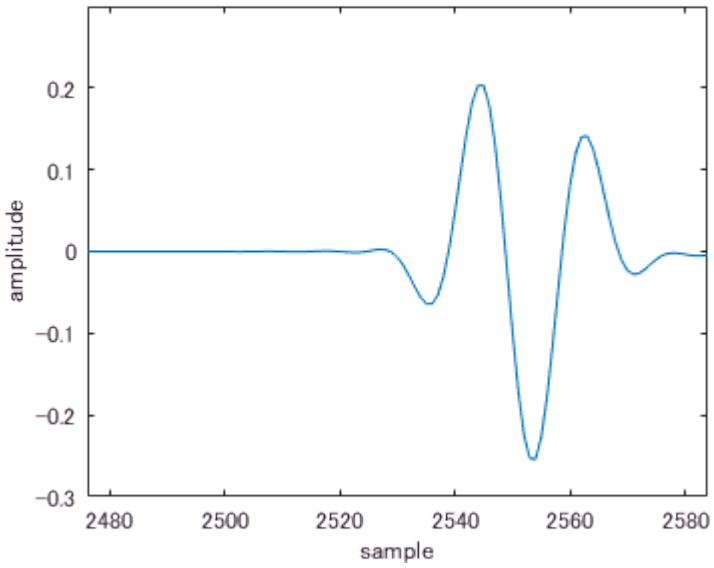
```
figure;
wave2 = wave(2360:2616);
[AIC] = aicval(wave2);
yyaxis left
plot(2360:2615,AIC);
ylabel('AIC')
xlim([2360 2615])
yyaxis right
plot(2360:2615,wave2(1:end-1))
xlabel('sample')
ylabel('amplitude')
exportfig('../result/2018_02_20_AIC1-1_kwave_ring_object','png',[400,300]);
```




```
figure;
wave2 = wave(2360:2616);
[AIC] = aicval(wave2);
yyaxis left
plot(2360:2615,AIC);
ylabel('AIC')
xlim([2360 2615])
yyaxis right
plot(2360:2615,wave2(1:end-1))
xlabel('sample')
ylabel('amplitude')
xlim([2465 2582])
ylim([-0.300 0.233])
exportfig('../result/2018_02_20_AIC1-2_kwave_ring_object','png',[400,300]);
```

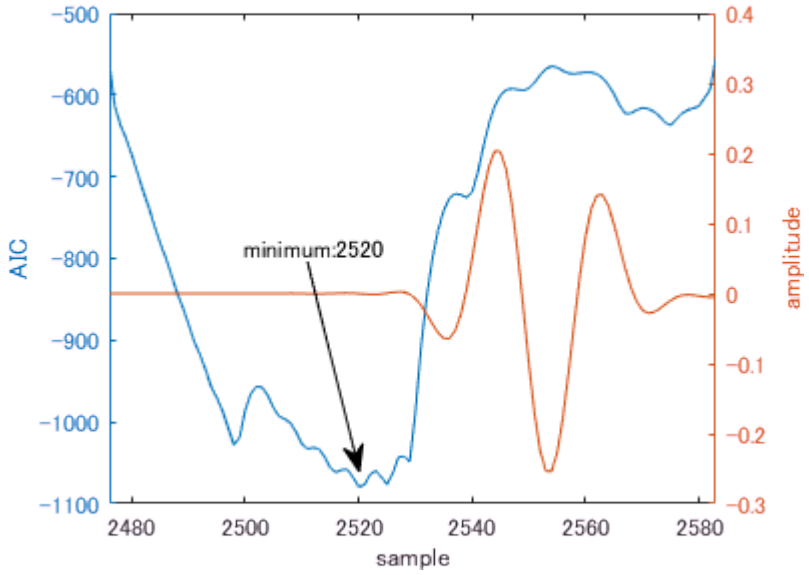



```
figure;
plot(wave);
xlim([2476 2584])
ylim([-0.300 0.300])
xlabel('sample')
ylabel('amplitude')
exportfig('\\Azlab-fs01\東研究室\個人work\竹内(ひ)\result\AIC\2018_02_20_test2_kwave_ring_object','p
```

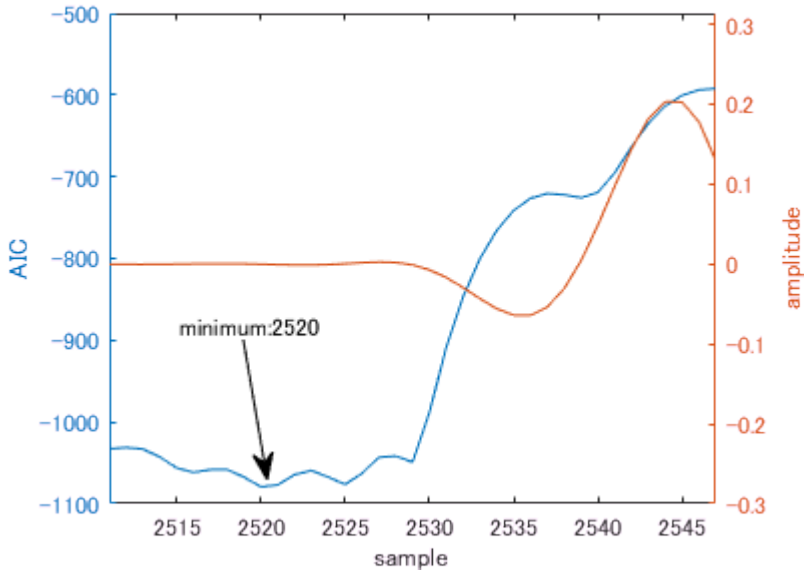



```
figure;
wave3 = wave(2476:2584);
[AIC2] = aicval(wave3);
yyaxis left
plot(2476:2583,AIC2);
ylabel('AIC')
xlim([2476 2583])
yyaxis right
```

```
plot(2476:2583,wave3(1:end-1))
xlabel('sample')
ylabel('amplitude')
annotation('textarrow',[0.38 0.445],[0.5133 0.1633],'String','minimum:2520')
exportfig('\\Azlab-fs01\東研究室\個人work\竹内(ひ)\result\AIC\2018_02_20_AIC2-1_kwave_ring_object_co
```




```
figure;
yyaxis left
plot(2476:2583,AIC2);
ylabel('AIC')
xlim([2476 2583])
yyaxis right
plot(2476:2583,wave3(1:end-1))
xlabel('sample')
ylabel('amplitude')
xlim([2511 2547])
ylim([-0.300 0.314])
annotation('textarrow',[0.3 0.33],[0.3833 0.15],'String','minimum:2520')
exportfig('\\Azlab-fs01\東研究室\個人work\竹内(ひ)\result\AIC\2018_02_20_AIC2-2_kwave_ring_object_co
```



上のものは，通常のAIC定義式に則って計算したもの・

下に続くものは，AICをエントロピー（平均情報量）の和としてみなしたときの結果・

・正規分布をモデルとしたエントロピー

$$H_1(x) = \frac{1}{2} + \log(\sigma) + \frac{1}{2}\log(2\pi)$$

・ラプラス分布をモデルとしたときのエントロピー

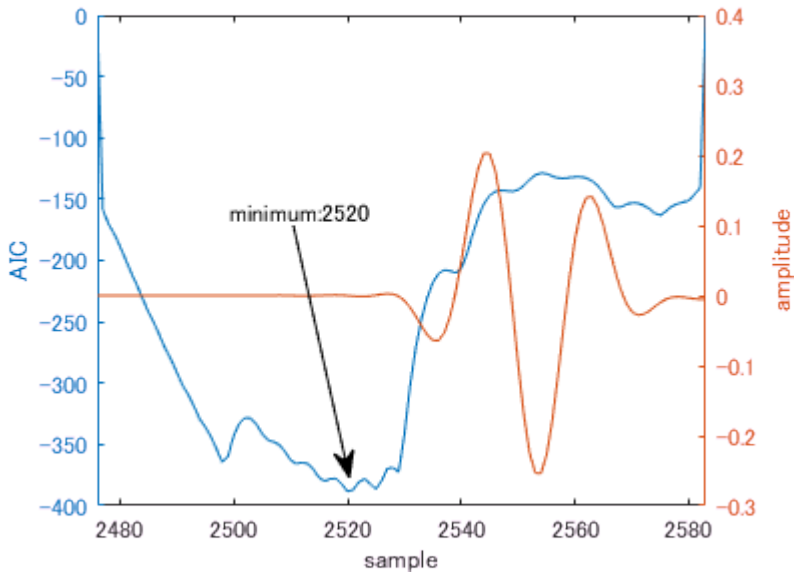
$$H_2(x) = 1 + \log(\sigma) + \frac{1}{2}\log(2)$$

すなわち

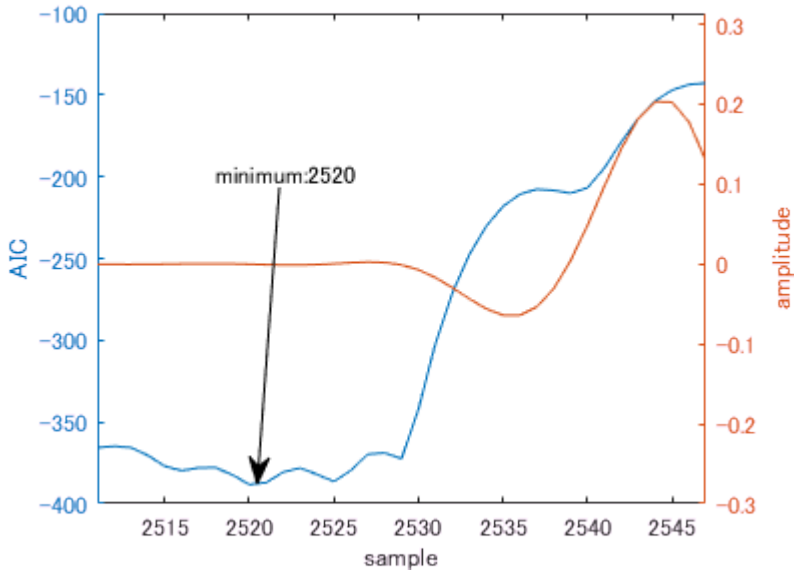
$$\mathrm{AIC}(k)_{\mathrm{proposed}} = k \times H_1(X[1,k]) + (N-k) \times H_2(X[k+1,N])$$

となる・

```
figure;
wave3 = wave(2476:2584);
[AIC3] = proposed_aicval(wave3);
yyaxis left
plot(2476:2583,AIC3);
ylabel('AIC')
xlim([2476 2583])
yyaxis right
plot(2476:2583,wave3(1:end-1))
xlabel('sample')
ylabel('amplitude')
annotation('textarrow',[0.375 0.445],[0.5767 0.1567],'String','minimum:2520')
exportfig('\\Azlab-fs01\東研究室\個人work\竹内(ひ)\result\AIC\2018_02_20_AIC3-1_kwave_ring_object_p
```

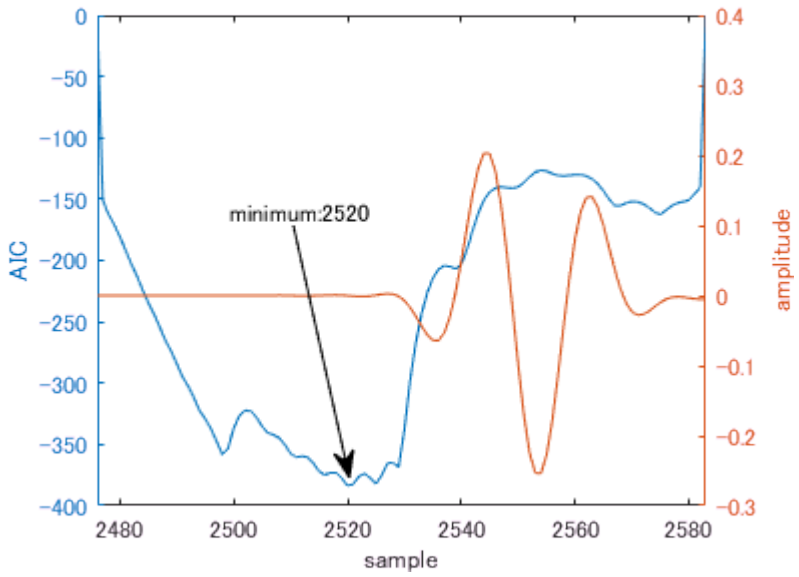



```
figure;
yyaxis left
plot(2476:2583,AIC3);
ylabel('AIC')
xlim([2476 2583])
yyaxis right
plot(2476:2583,wave3(1:end-1))
xlabel('sample')
ylabel('amplitude')
xlim([2511 2547])
ylim([-0.300 0.314])
annotation('textarrow',[0.3575 0.33],[0.6367 0.1433],'String','minimum:2520')
exportfig('\\Azlab-fs01\東研究室\個人work\竹内(ひ)\result\AIC\AIC2018_02_20_AIC3-2_kwave_ring_object
```

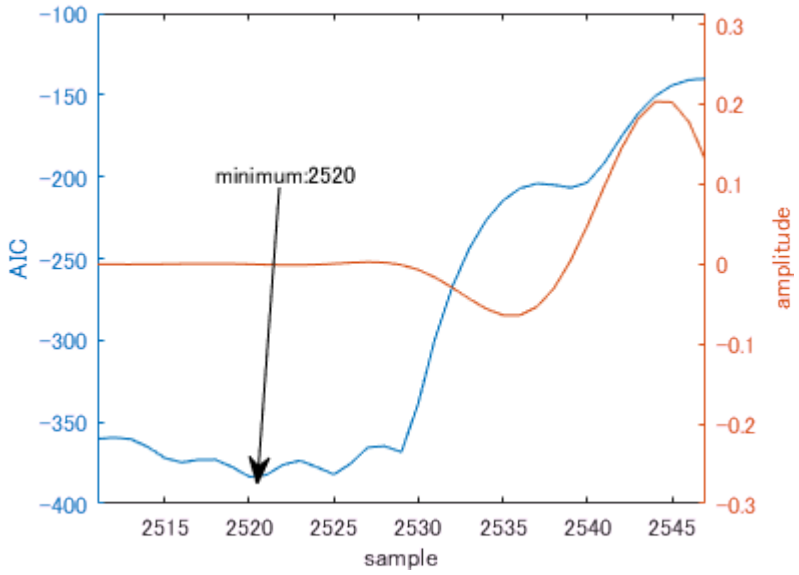



```
figure;
wave3 = wave(2476:2584);
```

```
[AIC4] = norm_dist_aicval(wave3);
yyaxis left
plot(2476:2583,AIC4);
ylabel('AIC')
xlim([2476 2583])
yyaxis right
plot(2476:2583,wave3(1:end-1))
xlabel('sample')
ylabel('amplitude')
annotation('textarrow',[0.375 0.445],[0.5767 0.1567],'String','minimum:2520')
exportfig('\\Azlab-fs01\東研究室\個人work\竹内(ひ)\result\AIC\2018_02_20_AIC4-1_kwave_ring_object_no
```




```
figure;
yyaxis left
plot(2476:2583,AIC4);
ylabel('AIC')
xlim([2476 2583])
yyaxis right
plot(2476:2583,wave3(1:end-1))
xlabel('sample')
ylabel('amplitude')
xlim([2511 2547])
ylim([-0.300 0.314])
annotation('textarrow',[0.3575 0.33],[0.6367 0.1433],'String','minimum:2520')
exportfig('\\Azlab-fs01\東研究室\個人work\竹内(ひ)\result\AIC\AIC2018_02_20_AIC4-2_kwave_ring_object
```




```
[a,b] = min(AIC4);
```

AIC法

1・従来

2・提案その1

```
function [a] = aicval(x)
if ~isempty(x)
    n = length(x);
    a = zeros(n-1,1);
    for i=1:n-1
        %compute variance in first part
        s1 = var(x(1:i));
        if s1 <= 0
            s1 = 0;
        else
            s1=log(s1);
        end
        %compute variance in second part
        s2 = var(x(i+1:n));
        if s2 <= 0
            s2 = 0;
        else
            s2=log(s2);
        end
        a(i) = i*(s1) + (n-i+1)*(s2);
    end
else
    a = 0;
end
end
```

```
function [a] = proposed_aicval(x)
if ~isempty(x)
    n = length(x);
    a = zeros(n-1,1);
    for i=1:n-1
        %compute variance in first part
        s1 = 1/2 + log(std(x(1:i))) + (1/2)*log(2*pi);
        %compute variance in second part
        s2 =1 + log(std(x(i+1:n))) + (1/2)*log(2);
        a(i) = i*(s1) + (n-i+1)*(s2);
    end
else
    a = 0;
end
a(isinf(a)) = 0;
end
```

```
function [a] = norm_dist_aicval(x)
if ~isempty(x)
    n = length(x);
    a = zeros(n-1,1);
    for i=1:n-1
        %compute variance in first part
        s1 = 1/2 + log(std(x(1:i))) + (1/2)*log(2*pi);
        %compute variance in second part
        s2 = 1/2 + log(std(x(i+1:n))) + (1/2)*log(2*pi);
        a(i) = i*(s1) + (n-i+1)*(s2);
    end
else
    a = 0;
end
a(isinf(a)) = 0;
end
```