

```
gray_image = rgb2gray(imread('..\images\15R_207_COLOR2D.jpg'));
I = imbinarize(gray_image, 0.3);
se = strel('line',8,8);
gray_image = imdilate(gray_image,se);

%se = strel('line',15,15);

gray_image = imerode(gray_image,se);

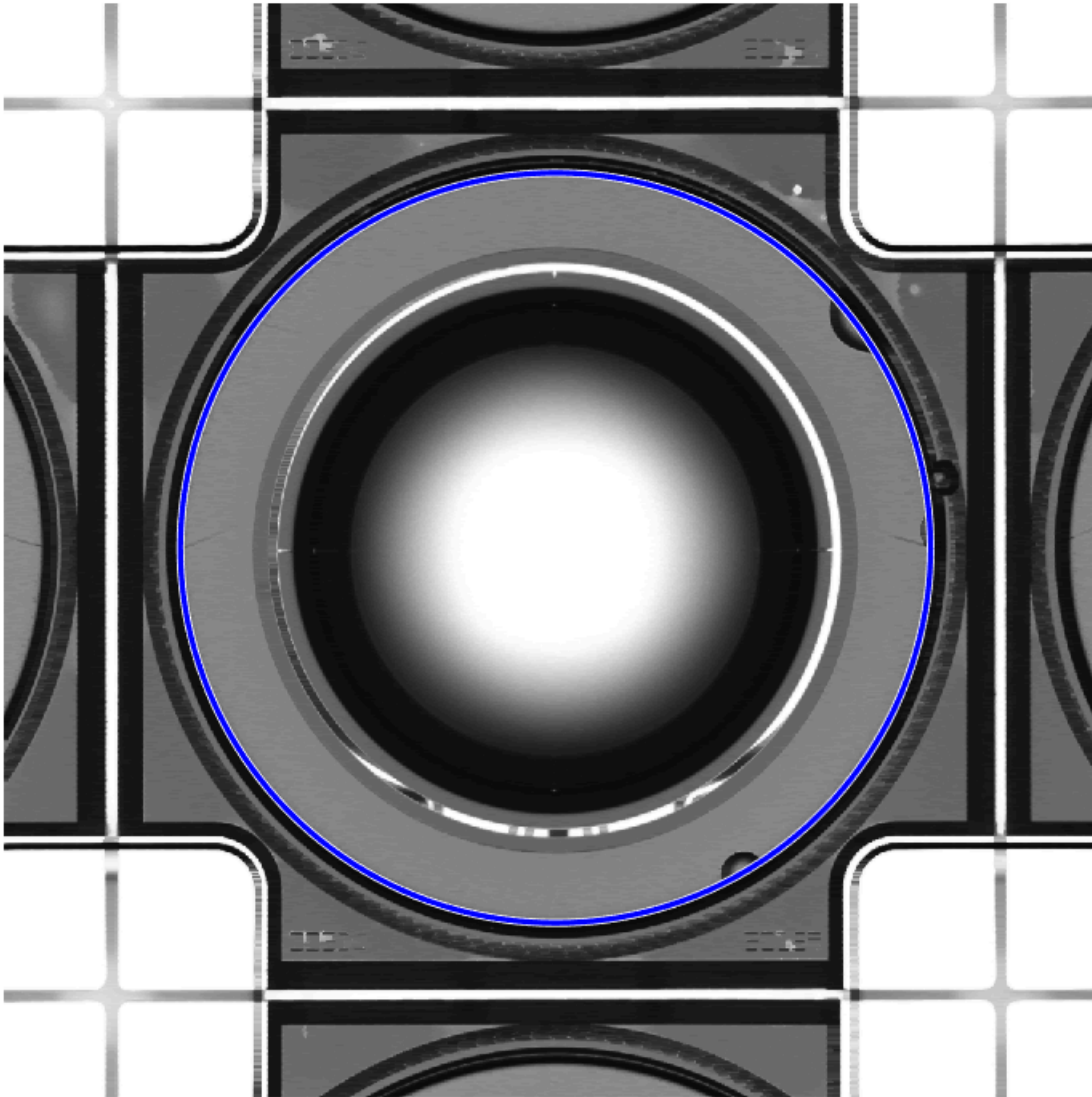
imshow(gray_image)
```

Warning: Image is too big to fit on screen; displaying at 67%

```
[centers, radii, metric] =imfindcircles(I,[350,370],'Sensitivity',.98);

centersStrong5 = centers(1:1,:);
radiiStrong5 = radii(1:1);
metricStrong5 = metric(1:1);

viscircles(centersStrong5, radiiStrong5,'EdgeColor','b');
```



```
theta=-pi:0.005:pi;%you can increase this if this isn't enough yet  
intensity_array = zeros(length(theta));
```

```
for j = 5:6  
    radius= radii(1)-j  
    x=centers(1,1)+radius*cos(theta);  
    y=centers(1,2)+radius*sin(theta);  
  
    for i = 1:length(theta)  
        int_x = round(x(1,i));  
        int_y = round(y(1,i));
```

```

    %plot(int_x, int_y,'rd','MarkerSize',3)
    if gray_image(int_x,int_y)>0
        intensity_array(i) = intensity_array(i)+gray_image(int_x,int_y);
    end
end
end
end

```

```

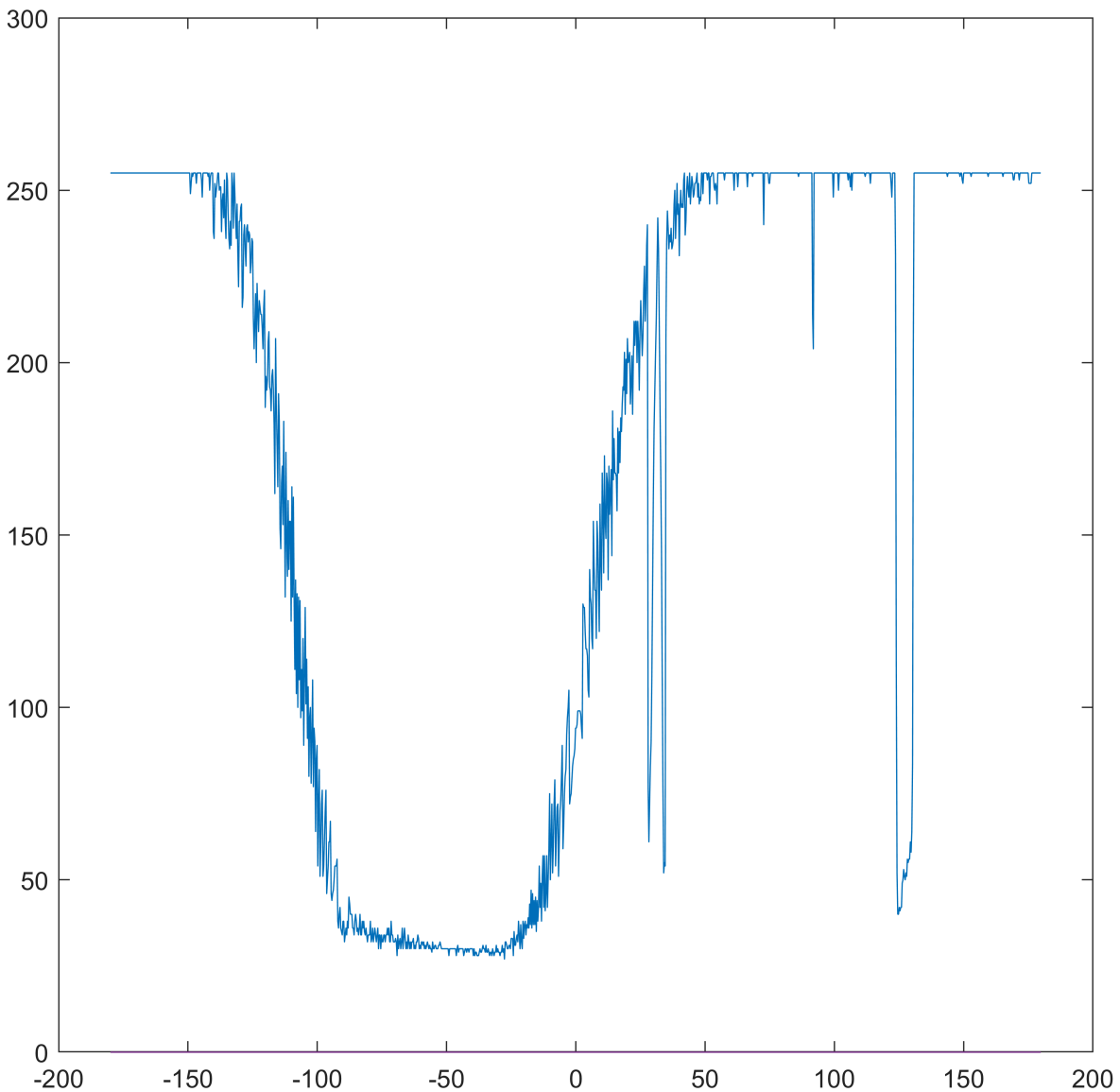
radius = 346.0389
radius = 345.0389

```

```

plot(rad2deg(theta),intensity_array)

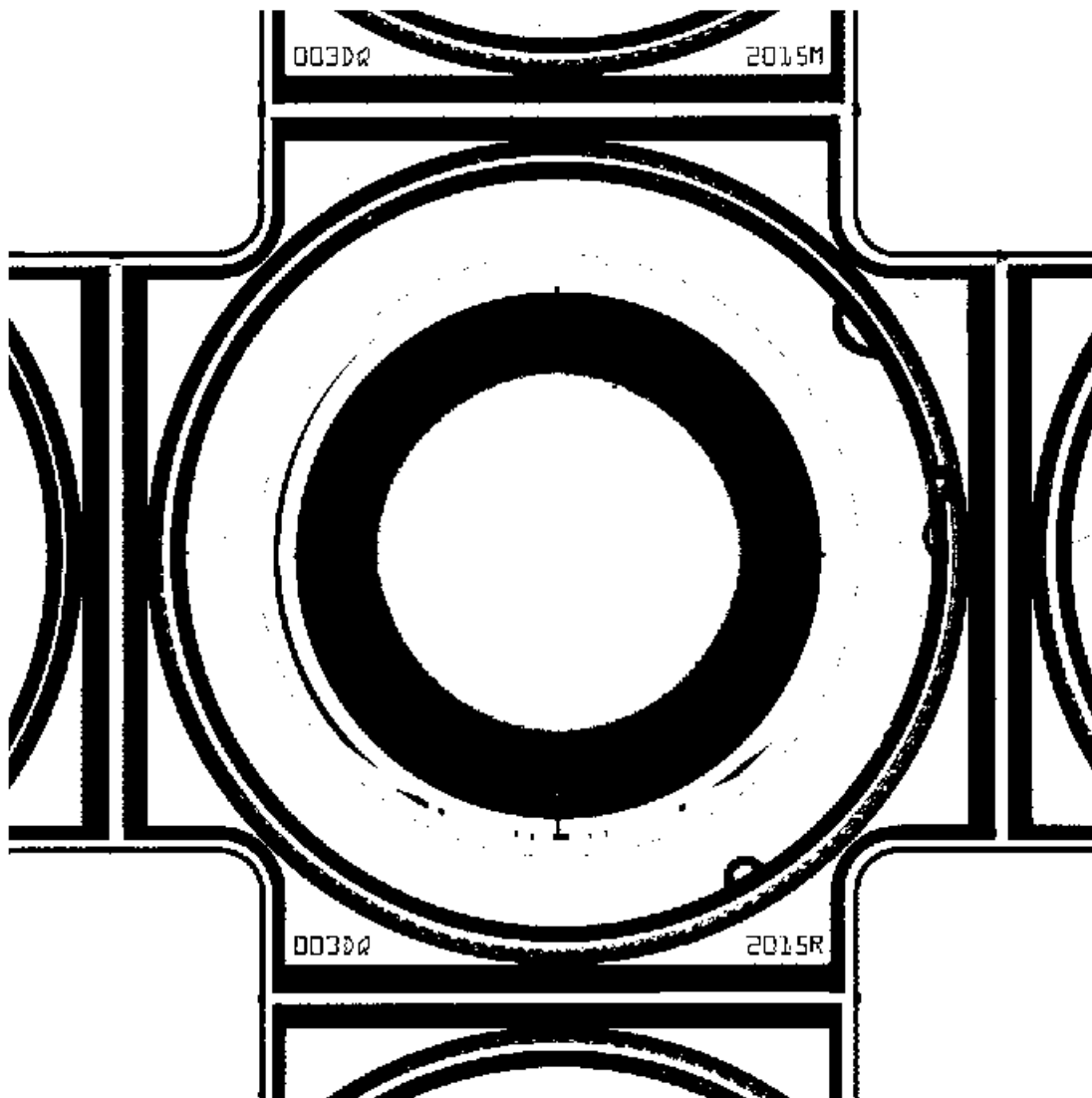
```



```

imshow(I);

```



```
%hold on;
j=1
```

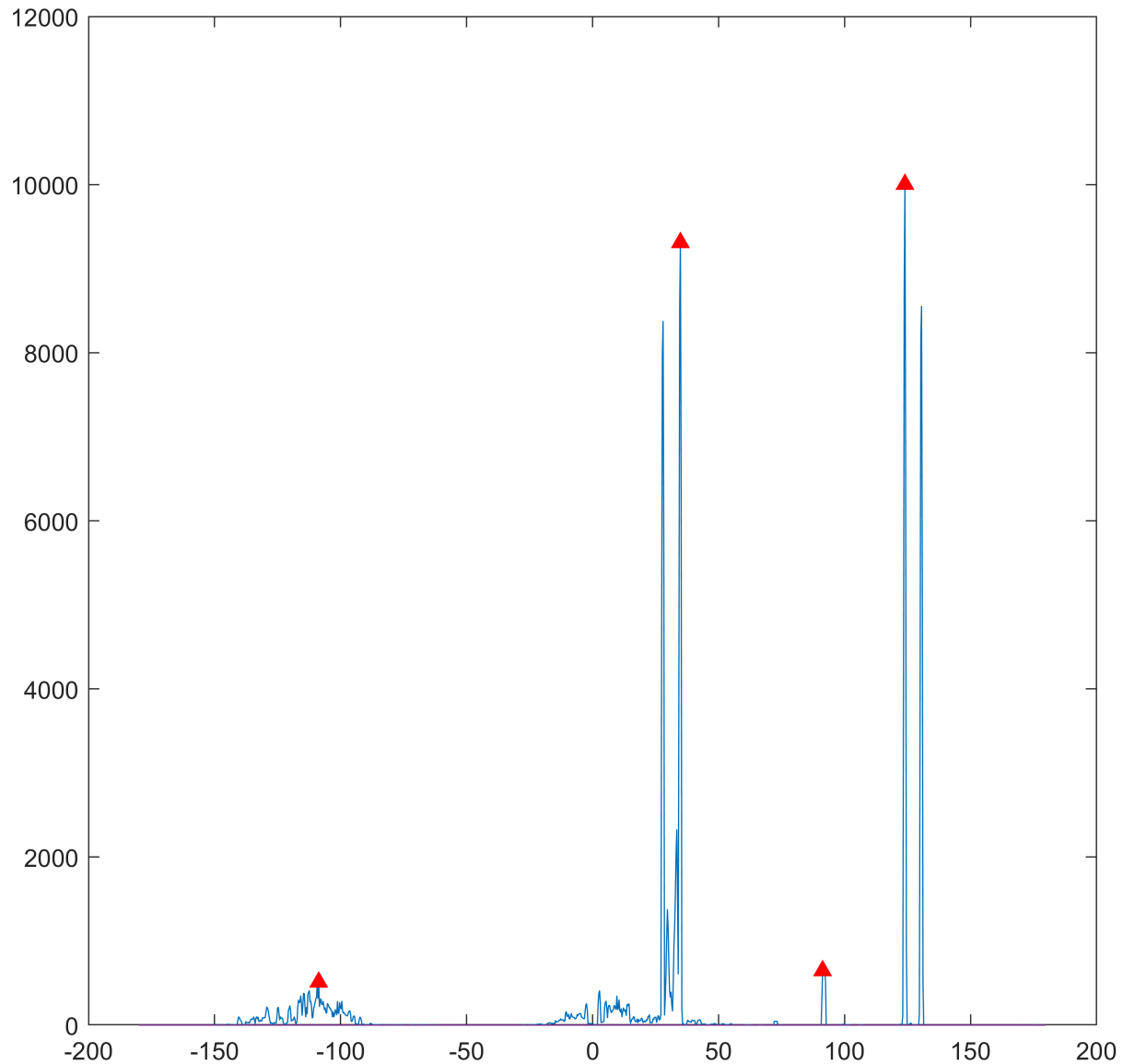
```
j = 1
```

```
for i = 1:length(x)
    if round(intensity_array(i))>0
        % plot((centers(1,1)+radius*cos(-3.14+6.28*i/length(theta))), (centers(1,2)+radius*sin(-3.14+6.28*i/length(theta))), 'b');
        j = j+1;
    end
end
```

```

moving_var = movvar(intensity_array,5);
moving_var_tr=transpose(moving_var(:,1));
plot(rad2deg(theta),moving_var)
hold on
[PKAmp,PKTime]=findpeaks(moving_var_tr,rad2deg(theta),'MinPeakProminence', 400, 'MinPeakDistance', 10);
plot(PKTime, PKAmp, '^r', 'MarkerFaceColor','r')
hold off

```



```

imshow(gray_image)
hold on
for i = 1:length(PKTime)

```

```
plot(centers(1,1)+radius*cos(3.14/2-1*deg2rad(PKTime(i))), centers(1,2)+radius*sin(3.14/2-1*deg2rad(PKTime(i))), 'o', 'r', 'filled', 'LineWidth', 2)
```

```
end
```

