## CORE SAMPLE NUMERICAL POROSITY CALCULATION CODE BY MATLAB

infoDry = dicominfo('I:\NEW THESIS\experi data\sccore51\sccore5\_11.dcm');

infoWet = dicominfo('I:\NEW THESIS\experi data\sccore52\sccore52\_11.dcm');

YDry = dicomread(infoDry);

YDry\_D = double(YDry);

YDry\_D1 = zeros(512,512);

counter = 0;

total = 0;

for i = 1:512

for j = 1:512

if (YDry\_D(i,j)<-1000 || YDry\_D(i,j)>4000)

 YDry\_D1(i,j) = NaN;

elseif ((sqrt((i-256)^2+(j-256)^2)) > 180)

 YDry\_D1(i,j) = NaN;

else

 YDry\_D1(i,j) = YDry\_D(i,j);

counter = counter + 1;

total = total + YDry\_D(i,j);

end

end

end

Figure('Name','Dry');

sDry = surf(YDry\_D1, 'EdgeColor','none');

averageDry = total/counter

view(2);

%Figure('Name', 'DryImage')

%imshow(YDry,[]);

YWet = dicomread(infoWet);

YWet\_D = double(YWet);

YWet\_D1 = zeros(512,512);

counter = 0;

total = 0;

for i = 1:512

for j = 1:512

if (YWet\_D(i,j)<-1000 || YWet\_D(i,j)>4000)

 YWet\_D1(i,j) = NaN;

elseif ((sqrt((i-256)^2+(j-256)^2)) > 180)

 YWet\_D1(i,j) = NaN;

else

 YWet\_D1(i,j) = YWet\_D(i,j);

counter = counter + 1;

total = total + YWet\_D(i,j);

end

end

end

Figure('Name','Wet');

sWet = surf(YWet\_D1, 'EdgeColor','none');

averageWet = total/counter

view(2);

%Figure('Name', 'WetImage')

%imshow(YWet,[]);

Difference = (YWet\_D1 - YDry\_D1)/1000;

Figure('Name','Difference');

sDifference = surf(Difference, 'EdgeColor','none');

view(2);

porosity = (averageWet - averageDry)/100

## CORE SAMPLE NUMERICAL SATURATION CALCULATION CODE BY MATLAB FOR CORE 5 INITIAL SATURATIONS

infosat = dicominfo('I:\NEW THESIS\thesis data\core#5\SC CORE 5WD\SC CORE 5-WD\_15.dcm');

infoDec = dicominfo('I:\NEW THESIS\thesis data\core#5\SC CORE5-RD\SC CORE5-RD\_15.dcm');

infoWat = dicominfo('I:\NEW THESIS\thesis data\core#5\SC CORE 5W\SC CORE 5W\_15.dcm');

 Ysat = dicomread(infosat);

Ysat\_D = double(Ysat);

Ysat\_D1 = zeros(512,512);

counter = 0;

total = 0;

for i = 1:512

for j = 1:512

if (Ysat\_D(i,j)<-1000 || Ysat\_D(i,j)>4000)

 Ysat\_D1(i,j) = NaN;

elseif ((sqrt((i-256)^2+(j-256)^2)) > 180)

 Ysat\_D1(i,j) = NaN;

else

 Ysat\_D1(i,j) = Ysat\_D(i,j);

 counter = counter + 1;

 total = total + Ysat\_D(i,j);

end

end

end

Figure('Name','Sat');

ssat = surf(Ysat\_D1, 'EdgeColor','none');

averagesat = total/counter

view(2);

%Figure('Name', 'satImage')

%imshow(Ysat,[]);

YDec = dicomread(infoDec);

YDec\_D = double(YDec);

YDec\_D1 = zeros(512,512);

counter = 0;

total = 0;

for i = 1:512

for j = 1:512

if (YDec\_D(i,j)<-1000 || YDec\_D(i,j)>4000)

 YDec\_D1(i,j) = NaN;

elseif ((sqrt((i-256)^2+(j-256)^2)) > 180)

 YDec\_D1(i,j) = NaN;

else

 YDec\_D1(i,j) = YDec\_D(i,j);

 counter = counter + 1;

 total = total + YDec\_D(i,j);

end

end

end

Figure('Name','Dec');

ssat = surf(YDec\_D1, 'EdgeColor','none');

averageDec = total/counter

view(2);

%Figure('Name', 'DecImage')

%imshow(YDec,[]);

YWat = dicomread(infoWat);

YWat\_D = double(YWat);

YWat\_D1 = zeros(512,512);

counter = 0;

total = 0;

for i = 1:512

for j = 1:512

if (YWat\_D(i,j)<-1000 || YWat\_D(i,j)>4000)

 YWat\_D1(i,j) = NaN;

elseif ((sqrt((i-256)^2+(j-256)^2)) > 180)

 YWat\_D1(i,j) = NaN;

else

 YWat\_D1(i,j) = YWat\_D(i,j);

 counter = counter + 1;

 total = total + YWat\_D(i,j);

end

end

end

Figure('Name','Wat');

sWat = surf(YWat\_D1, 'EdgeColor','none');

averageWat = total/counter

view(2);

%Figure('Name', 'WatImage')

%imshow(YWat,[]);

 %Difference = (YWat\_D1 - YDec\_D1)/1000;

 %Figure('Name','Difference');

%sDifference = surf(Difference, 'EdgeColor','none');

%view(2);

saturation = (averagesat - averageDec)/(averageWat - averageDec)\*100

## CORE SAMPLE NUMERICAL SATURATION CALCULATION CODE BY MATLAB FOR CORE5 AFTER POLYMER GEL INJECTION

infosat = dicominfo('I:\NEW THESIS\thesis data\core#5\SC CORE 5SWDPG\SC CORE 5SWDPG\_15.dcm');

infoDec = dicominfo('I:\NEW THESIS\thesis data\core#5\SC CORE5-RD\SC CORE5-RD\_15.dcm');

infoWat = dicominfo('I:\NEW THESIS\thesis data\core#5\SC CORE 5W\SC CORE 5W\_15.dcm');

Ysat = dicomread(infosat);

Ysat\_D = double(Ysat);

Ysat\_D1 = zeros(512,512);

counter = 0;

total = 0;

for i = 1:512

for j = 1:512

if (Ysat\_D(i,j)<-1000 || Ysat\_D(i,j)>4000)

 Ysat\_D1(i,j) = NaN;

elseif ((sqrt((i-256)^2+(j-256)^2)) > 180)

 Ysat\_D1(i,j) = NaN;

else

 Ysat\_D1(i,j) = Ysat\_D(i,j);

 counter = counter + 1;

 total = total + Ysat\_D(i,j);

end

end

end

Figure('Name','Sat');

ssat = surf(Ysat\_D1, 'EdgeColor','none');

averagesat = total/counter

view(2);

%Figure('Name', 'satImage')

%imshow(Ysat,[]);

YDec = dicomread(infoDec);

YDec\_D = double(YDec);

YDec\_D1 = zeros(512,512);

counter = 0;

total = 0;

for i = 1:512

for j = 1:512

if (YDec\_D(i,j)<-1000 || YDec\_D(i,j)>4000)

 YDec\_D1(i,j) = NaN;

elseif ((sqrt((i-256)^2+(j-256)^2)) > 180)

 YDec\_D1(i,j) = NaN;

else

 YDec\_D1(i,j) = YDec\_D(i,j);

 counter = counter + 1;

 total = total + YDec\_D(i,j);

end

end

end

Figure('Name','Dec');

ssat = surf(YDec\_D1, 'EdgeColor','none');

averageDec = total/counter

view(2);

%Figure('Name', 'DecImage')

%imshow(YDec,[]);

YWat = dicomread(infoWat);

YWat\_D = double(YWat);

YWat\_D1 = zeros(512,512);

counter = 0;

total = 0;

for i = 1:512

for j = 1:512

if (YWat\_D(i,j)<-1000 || YWat\_D(i,j)>4000)

 YWat\_D1(i,j) = NaN;

elseif ((sqrt((i-256)^2+(j-256)^2)) > 180)

 YWat\_D1(i,j) = NaN;

else

 YWat\_D1(i,j) = YWat\_D(i,j);

 counter = counter + 1;

 total = total + YWat\_D(i,j);

end

end

end

Figure('Name','Wat');

sWat = surf(YWat\_D1, 'EdgeColor','none');

averageWat = total/counter

view(2);

%Figure('Name', 'WatImage')

%imshow(YWat,[]);

%Difference = (YWat\_D1 - YDec\_D1)/1000;

%Figure('Name','Difference');

%sDifference = surf(Difference, 'EdgeColor','none');

%view(2);

saturation = (averagesat - averageDec)/(averageWat - averageDec)\*100