Test on matRad_gammaIndex.m

I run a test aim to understand the difference in the results of this function for different interpolation input methods and dimensions. I add a test on local and global gamma index calculation. I impose a threshold of 1% and 1mm

```
close all
threshold = [3 3];
```

Here we can see the differences between the new and the old programs

```
figure
tic;
[~,~,passrate_s] = matRad_gammaIndex_p(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution.y
ct.resolution.z],...
    threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'standard',0,'global');
time0=toc;

figure
matRad_gammaIndex_old(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution.y ct.resolution.z],
...
    threshold,round(pln.isoCenter(1,3)/ct.resolution.z));
```

```
matRad: using gamme criteria 3[mm], 3[%]matRad: using gamme criteria 3[mm], 3[%].
.
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.
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```
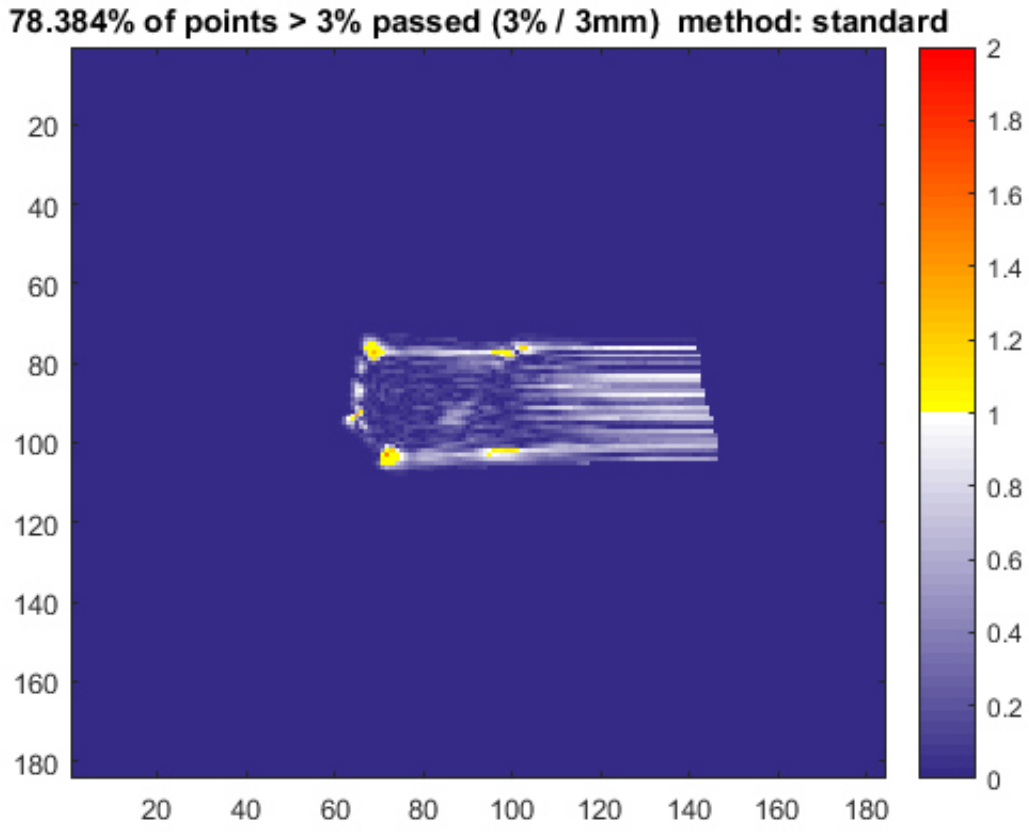
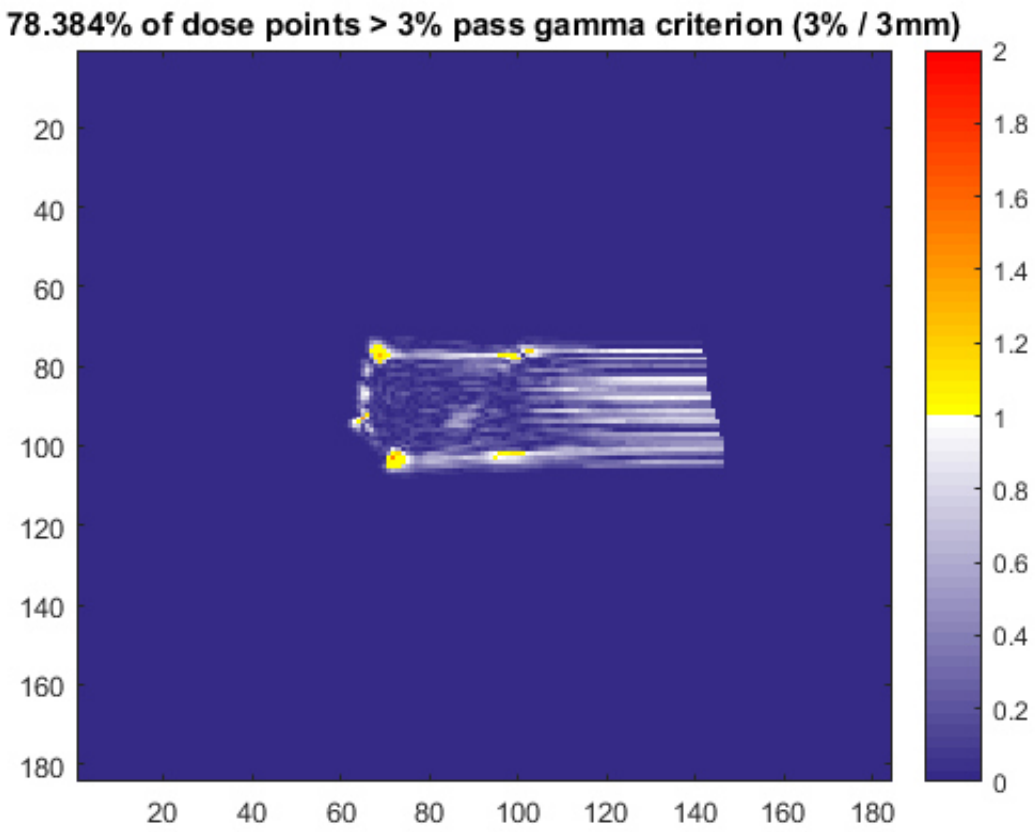



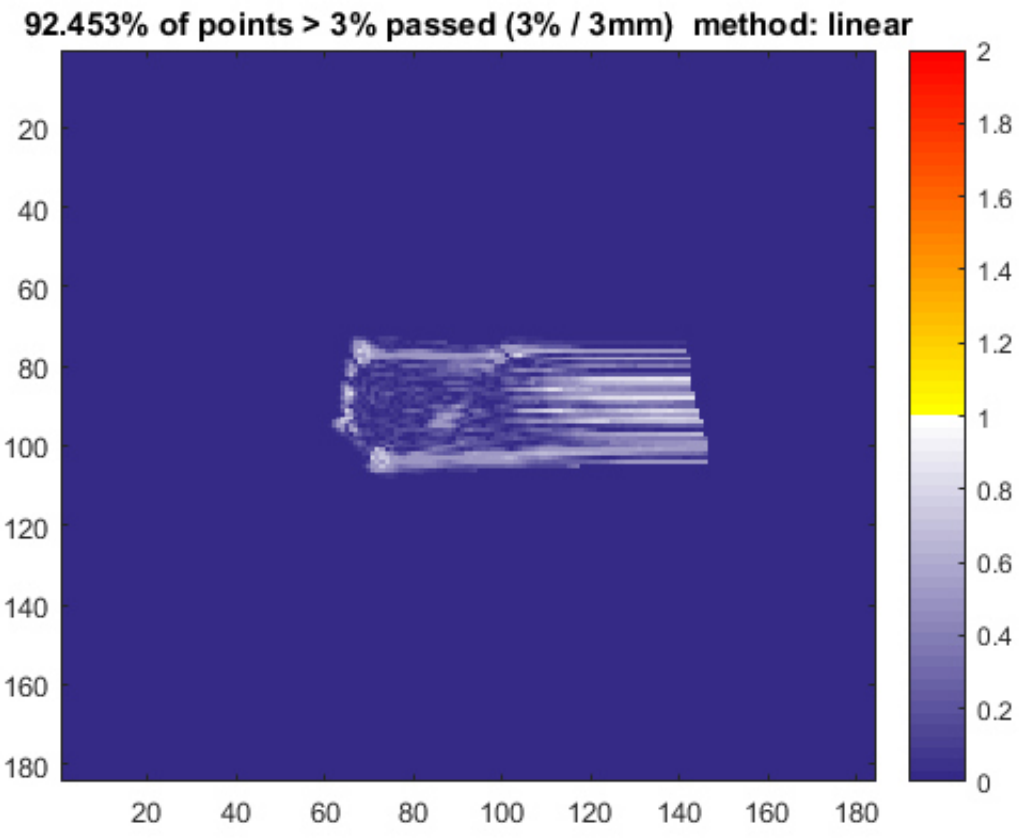


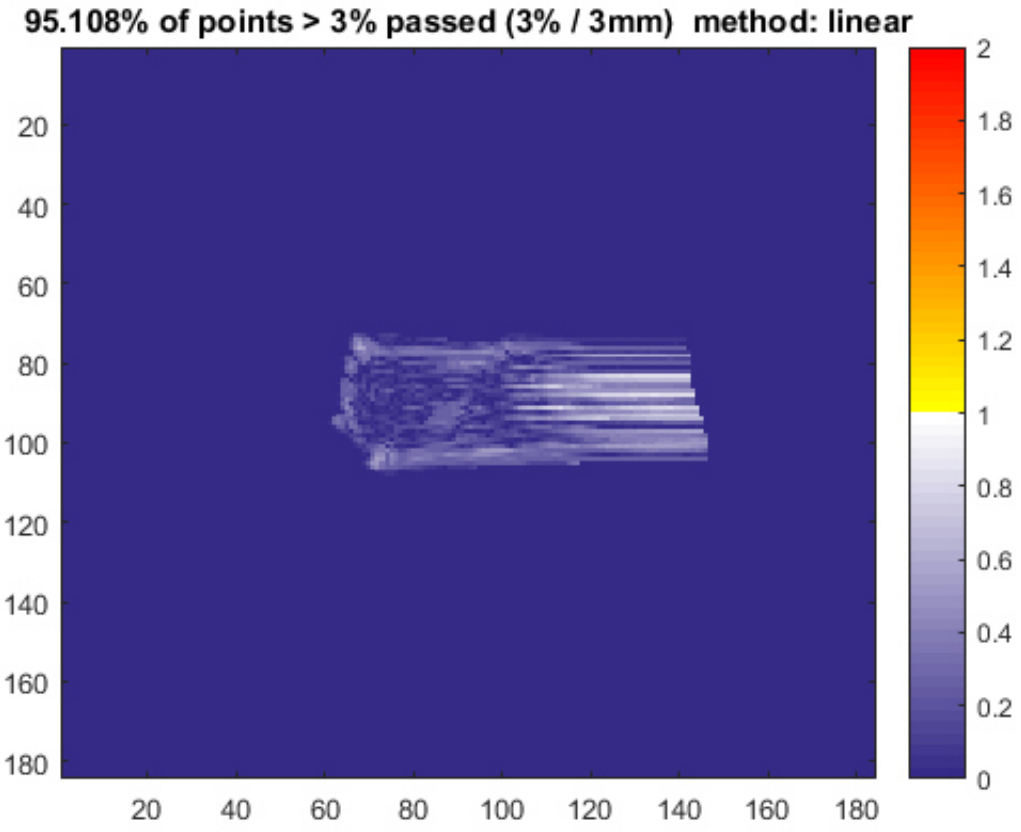
Here we check passrates with linear interpolation

```
figure
tic;
[~,~,passrate_l(1)] = matRad_gammaIndex_p(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
```

```
.y ct.resolution.z],...
    threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'linear',1,'global');
timeg(1)=toc;
figure
tic;
[~,~,passrate_l(2)] = matRad_gammaIndex_p(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
.y ct.resolution.z],...
    threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'linear',2,'global');
timeg(2)=toc;
figure
tic;
[~,~,passrate_l(3)] = matRad_gammaIndex_p(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
.y ct.resolution.z],...
    threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'linear',3,'global');
timeg(3)=toc;
figure
tic;
[~,~,passrate_l(4)] = matRad_gammaIndex_p(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
.y ct.resolution.z],...
 threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'linear',4,'global');
timeg(4)=toc;

figure
subplot(1,2,1)
plot([0:size(passrate_l,2)],[passrate_s passrate_l])
subplot(1,2,2)
plot([0:size(timeg,2)],[time0 timeg])
```

```
matRad: using gamme criteria 3[mm], 3[%]matRad: using gamme criteria 3[mm], 3[%]matRad: us
ing gamme criteria 3[mm], 3[%]matRad: using gamme criteria 3[mm], 3[%]
```




95.108% of points > 3% passed (3% / 3mm) method: linear
20
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120
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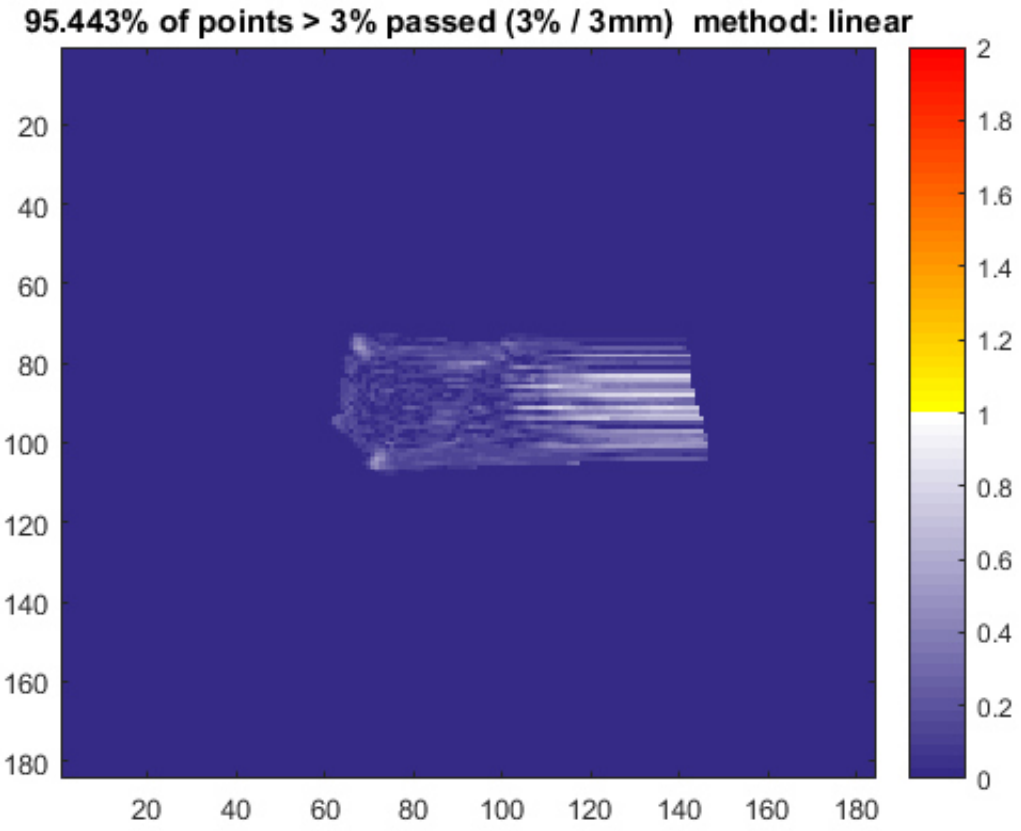
160
180
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0


95.443% of points > 3% passed (3% / 3mm) method: linear
20
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80
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120
140
160
180
20
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80
100
120
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160
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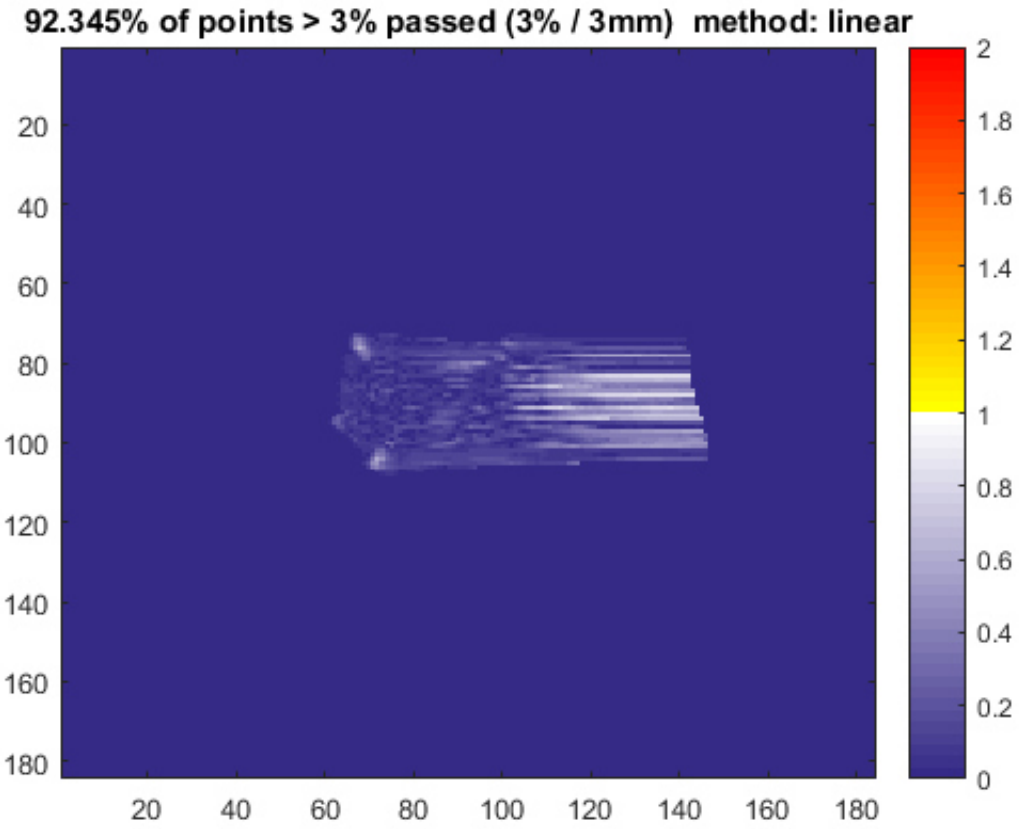
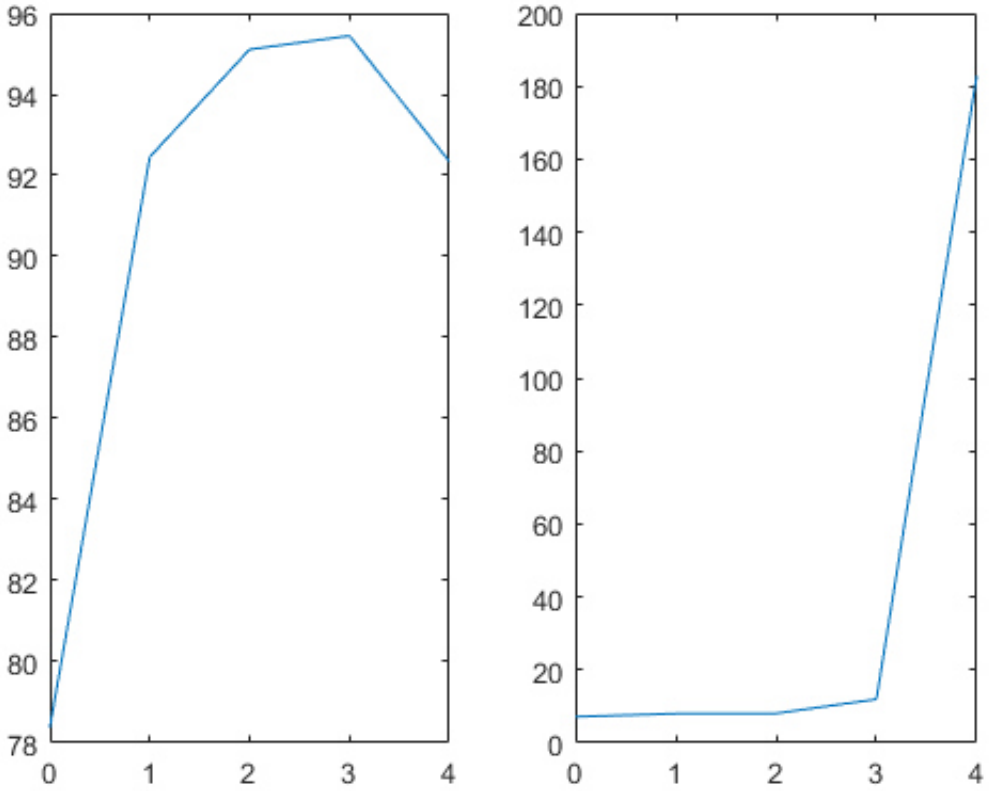
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0





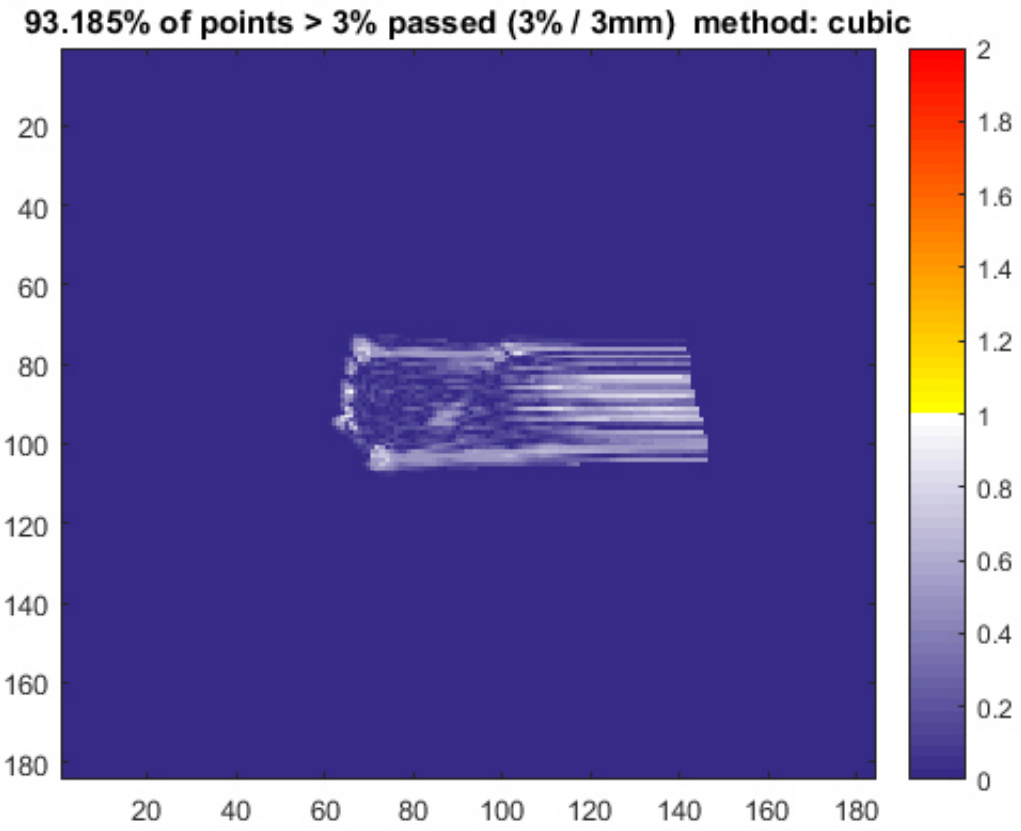
I repeat the same with cubic interpolation

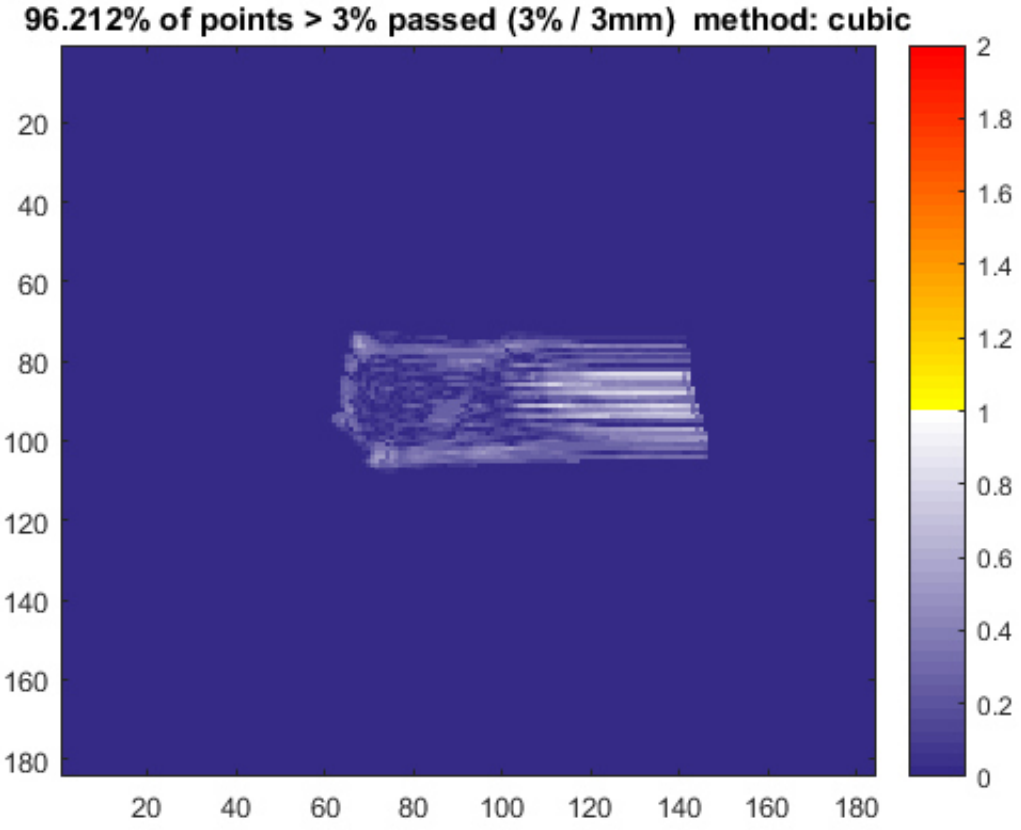
```
figure
[~,~,passrate_c(1)] = matRad_gammaIndex_p(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
.y ct.resolution.z],...
```

```
    threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'cubic',1,'global');
figure
[~,~,passrate_c(2)] = matRad_gammaIndex_p(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
.y ct.resolution.z],...
    threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'cubic',2,'global');
figure
[~,~,passrate_c(3)] = matRad_gammaIndex_p(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
.y ct.resolution.z],...
    threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'cubic',3,'global');
figure
[~,~,passrate_l(4)] = matRad_gammaIndex_p(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
.y ct.resolution.z],...
    threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'cubic',4,'global');

figure
hold
plot([0:size(passrate_l,2)],[passrate_s passrate_l],'b')
plot([0:size(passrate_c,2)],[passrate_s passrate_c],'r')
legend('linear','cubic')

% %%
% % in this part we have the same results for local gamma calculation
% figure
% [~,~,passrateloc_s] = matRad_gammaIndex(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
.y ct.resolution.z],...
%     threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'standard','local');
%
% figure
% [~,~,passrateloc_l(1)] = matRad_gammaIndex(dose_5mm,dose_3mm,[ct.resolution.x ct.resolut
ion.y ct.resolution.z],...
%     threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'linear',1,'local');
% figure
% [~,~,passrateloc_l(2)] = matRad_gammaIndex(dose_5mm,dose_3mm,[ct.resolution.x ct.resolut
ion.y ct.resolution.z],...
%     threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'linear',2,'local');
% figure
% [~,~,passrateloc_l(3)] = matRad_gammaIndex(dose_5mm,dose_3mm,[ct.resolution.x ct.resolut
ion.y ct.resolution.z],...
%     threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'linear',3,'local');
% %figure
% %[~,~,passrateloc_l(4)] = matRad_gammaIndex(dose_5mm,dose_3mm,[ct.resolution.x ct.resolu
tion.y ct.resolution.z],...
% %   threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'linear',4,'local');
%
% figure
% [~,~,passrate_c(1)] = matRad_gammaIndex(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
.y ct.resolution.z],...
%     threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'cubic',1,'local');
% figure
% [~,~,passrate_c(2)] = matRad_gammaIndex(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
.y ct.resolution.z],...
%     threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'cubic',2,'local');
% figure
% [~,~,passrate_c(3)] = matRad_gammaIndex(dose_5mm,dose_3mm,[ct.resolution.x ct.resolution
.y ct.resolution.z],...
%     threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'cubic',3,'local');
% % figure
% % [~,~,passrate_l(4)] = matRad_gammaIndex(dose_5mm,dose_3mm,[ct.resolution.x ct.resoluti
on.y ct.resolution.z],...
% %     threshold,round(pln.isoCenter(1,3)/ct.resolution.z),'cubic',4,'local');
%
```

```
% figure
% hold
% plot([0:size(passrateloc_l,2)],[passrateloc_s passrateloc_l],'b')
% plot([0:size(passrateloc_c,2)],[passrateloc_s passrateloc_c],'r')
% legend('linear','cubic')
```

```
matRad: using gamme criteria 3[mm], 3[%]matRad: using gamme criteria 3[mm], 3[%]matRad: us
ing gamme criteria 3[mm], 3[%]matRad: using gamme criteria 3[mm], 3[%]Current plot held
```




96.212% of points > 3% passed (3% / 3mm) method: cubic
20
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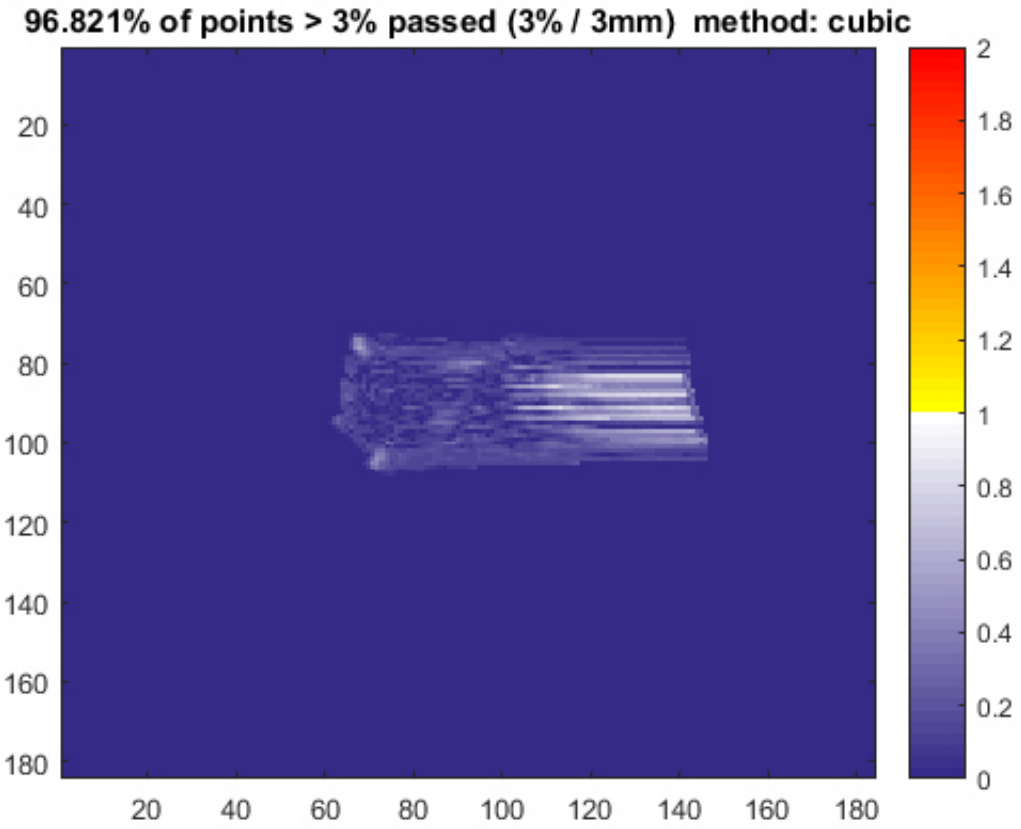
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0


96.821% of points > 3% passed (3% / 3mm) method: cubic
20
40
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2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
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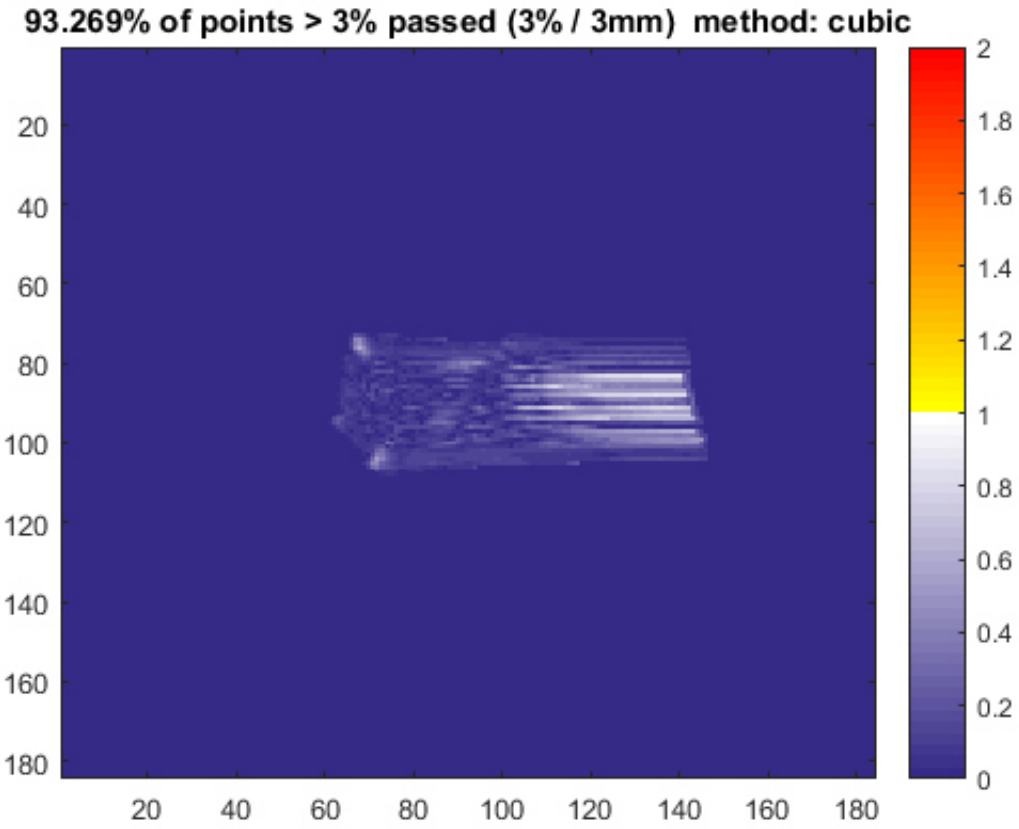

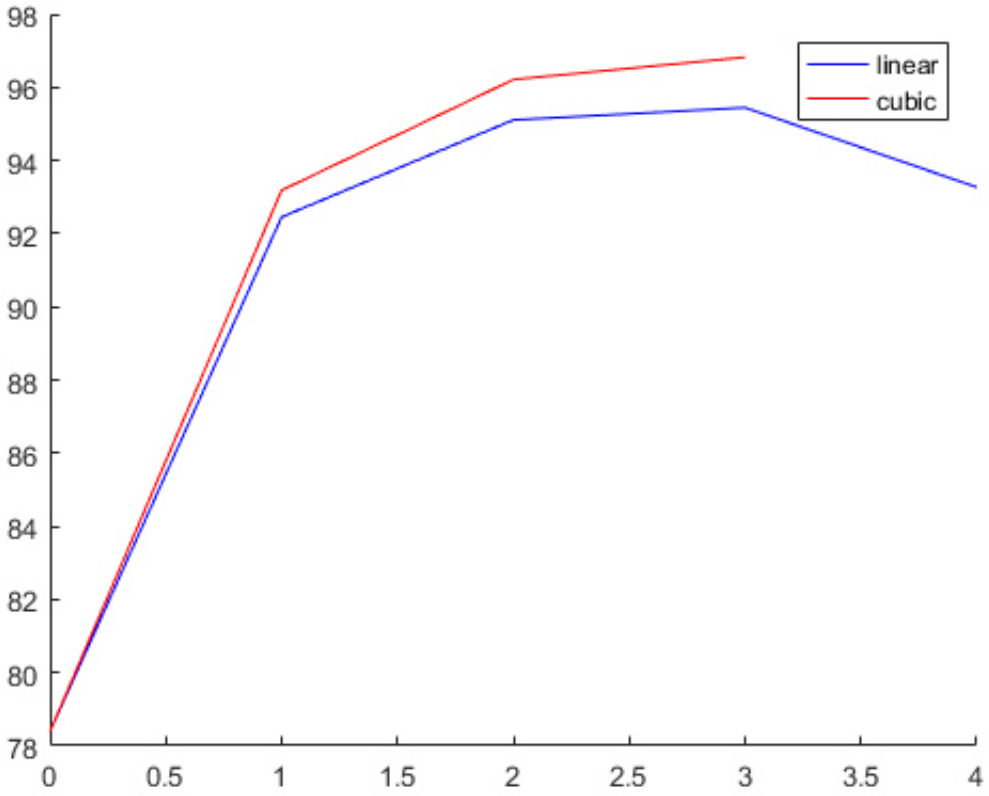

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