results

November 20, 2019

1 Exponents due to multiple convolution

1.1 exponent β

column	meaning
1	number of times convolution performed
2	at which x value height is measured
3	exponent β
4	std error

1.1.1 fast convolution

[14]:
```
beta = []

beta.append([1, 0.5, 0.13770117750850913, 0.0007452173365575101])
beta.append([2, 0.2, 0.1328849622968082,  0.0014796066590383032])
beta.append([5, 0.07, 0.12691042350850296, 0.0017649894629729798])
beta.append([10, 0.07, 0.12150731269045119, 0.0017133999245732526])
```

[15]:
```
beta
```

[15]:
```
[[1, 0.5, 0.13770117750850913, 0.0007452173365575101],
 [2, 0.2, 0.1328849622968082, 0.0014796066590383032],
 [5, 0.07, 0.12691042350850296, 0.0017649894629729798],
 [10, 0.07, 0.12150731269045119, 0.0017133999245732526]]
```

1.1.2 full convolution

[16]:
```
beta = []

beta.append([1, 0.5, 0.1377011775085092, 0.0007452173365565566])
beta.append([2, 0.2, 0.1328849622968016, 0.0014796066590384523])
beta.append([5, 0.07,0.12691042350850293, 0.0017649894629729798])
```

[17]:
```
beta
```

[17]:
```
[[1, 0.5, 0.1377011775085092, 0.0007452173365565566],
 [2, 0.2, 0.13288496229680816, 0.0014796066590384523],
 [5, 0.07, 0.12691042350850293, 0.0017649894629729798]]
```

[ ]:

1.2 Conclusion

1. Multiple convolution changes the exponents and messes up data collapse
2. Fast convolution seems to give exactly same result (upto 15 decimal places with threshold=1e-15) as full convolution.
3. data behaves badly after ~10 times convolution. slight change in x variable gives different exponent.
4. in special case 2 (even 3) times convolution can be allowed but no more than that

[ ]:

[ ]: