MSE-213
Probability and statistics for materials science
Lecture 8

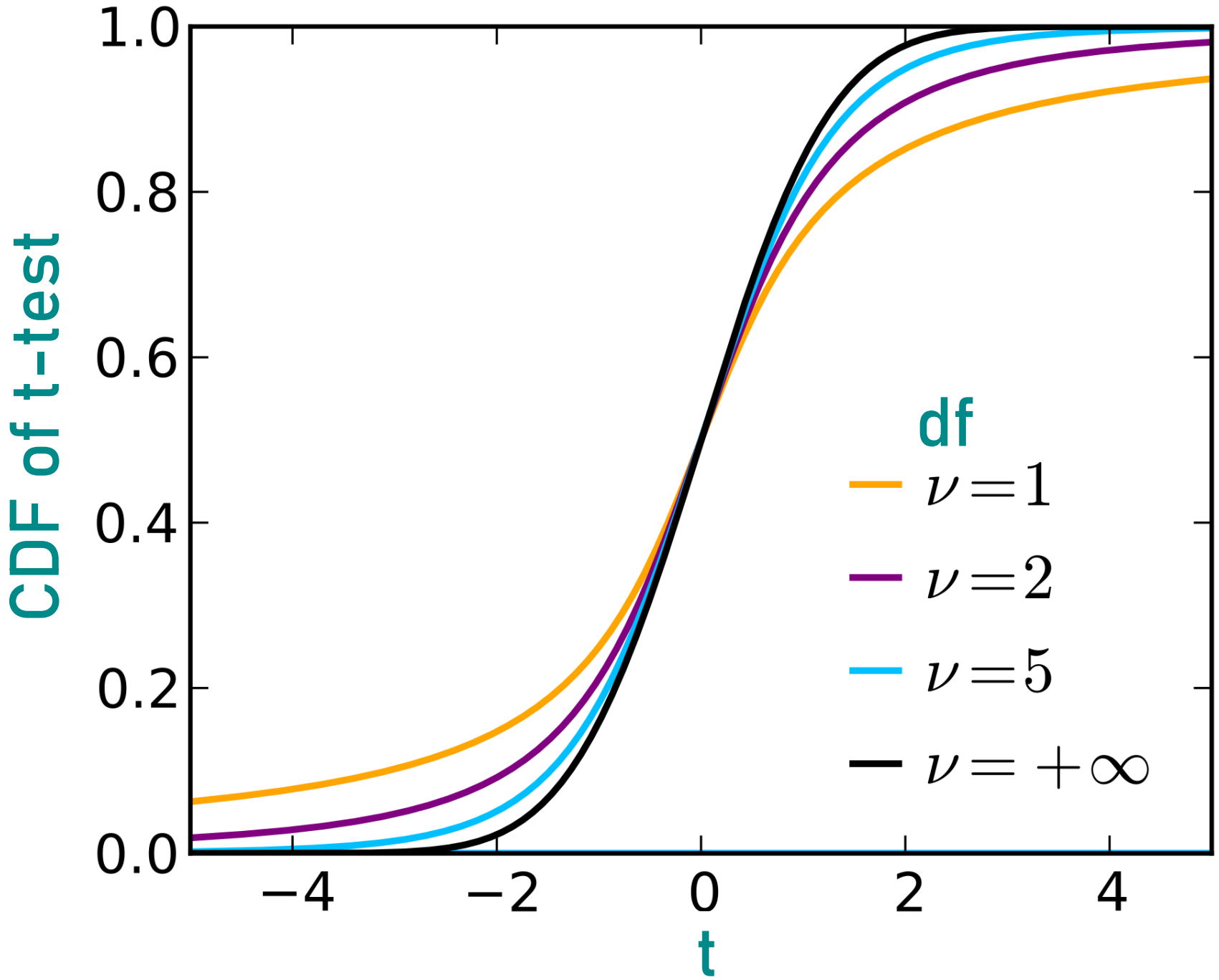
Recap: The t-test

ν	$qt_\nu(95\%)$	$qt_\nu(99\%)$
1	6,314	31,82
2	2,920	6,965
3	2,353	4,541
4	2,132	3,747
5	2,015	3,365
6	1,943	3,143
7	1,895	2,998
8	1,860	2,896
9	1,833	2,821
10	1,812	2,764
11	1,796	2,718
12	1,782	2,681
13	1,771	2,650
14	1,761	2,624
15	1,753	2,602
16	1,746	2,583
17	1,740	2,567
18	1,734	2,552
19	1,729	2,539
20	1,725	2,528

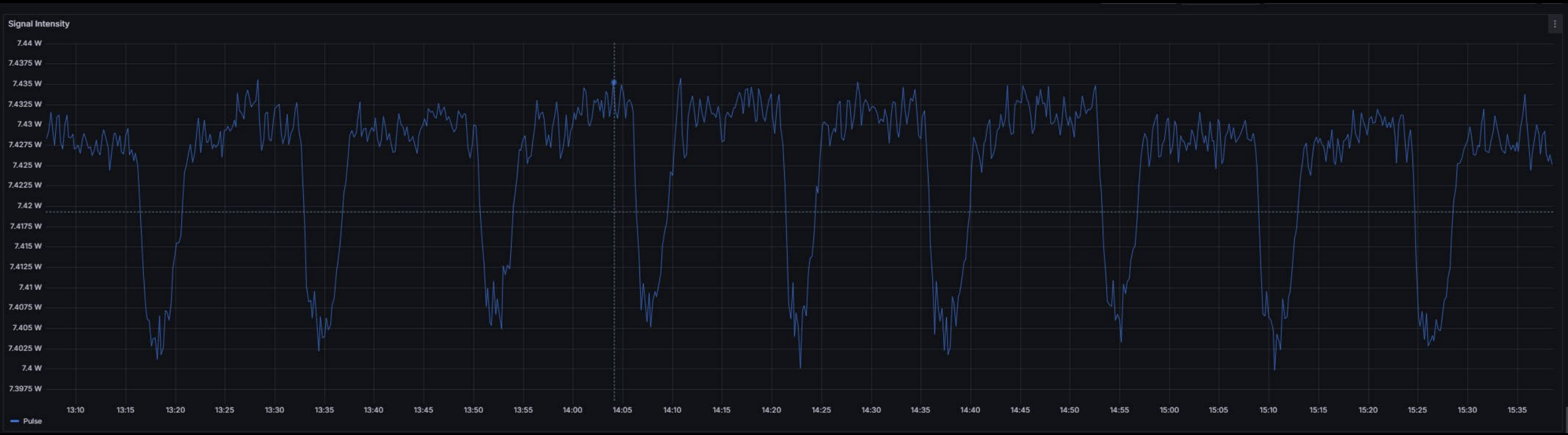
ν	$qt_\nu(95\%)$	$qt_\nu(99\%)$
21	1,721	2,518
22	1,717	2,508
23	1,714	2,500
24	1,711	2,492
25	1,708	2,485
26	1,706	2,479
27	1,703	2,473
28	1,701	2,467
29	1,699	2,462
30	1,697	2,457
32	1,694	2,449
34	1,691	2,441
36	1,688	2,434
38	1,686	2,429
40	1,684	2,423
50	1,676	2,403
60	1,671	2,390
120	1,658	2,358
∞	1,645	2,326

2.326 /2.358
= 0.986 429

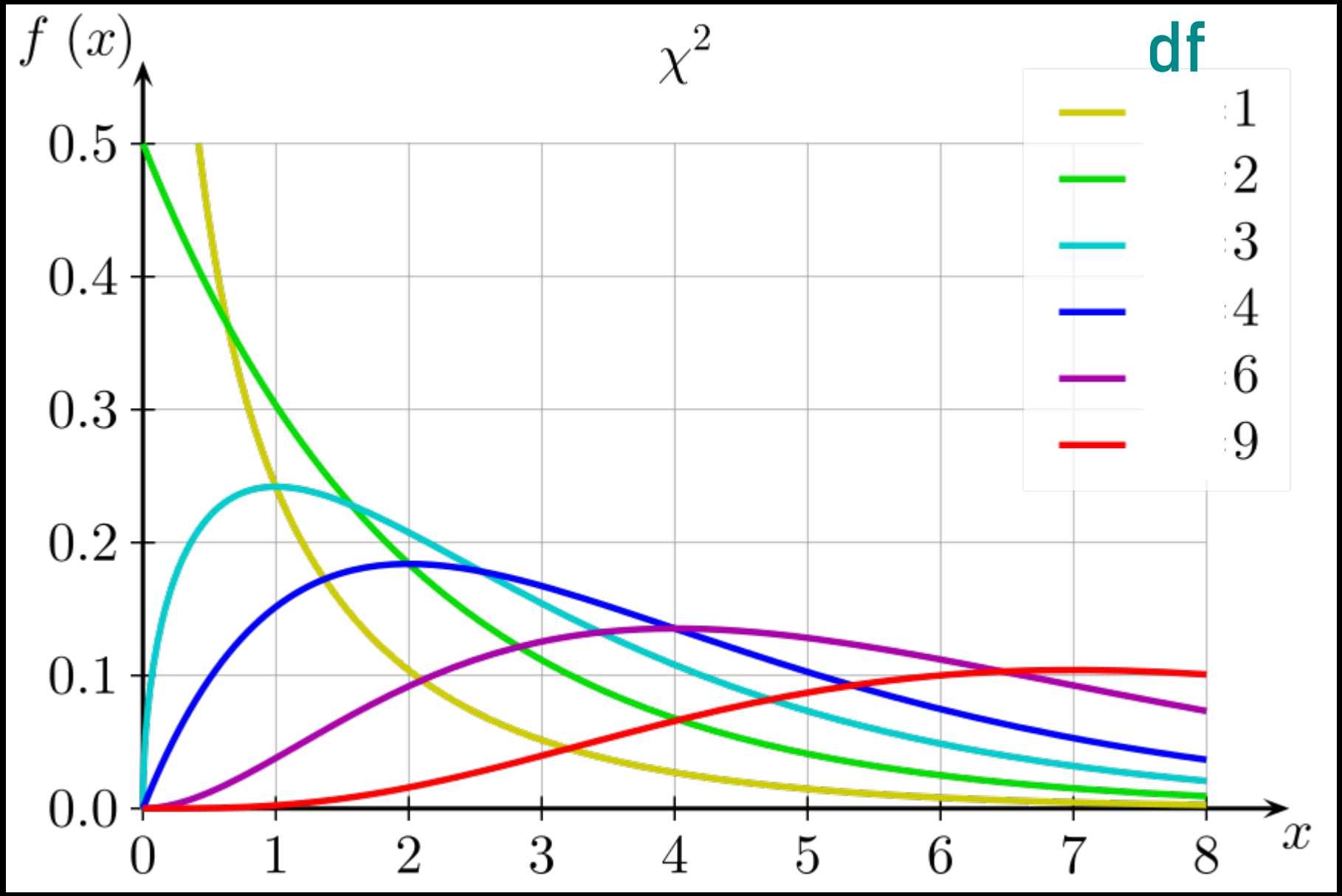
1.645 /1.658
= 0.992 159


CDF of t-test
1.0
0.8
0.6
0.4
0.2
0.0
−4
−2
0
2
4
t
df
$\nu = 1$
$\nu = 2$
$\nu = 5$
$\nu = +\infty$

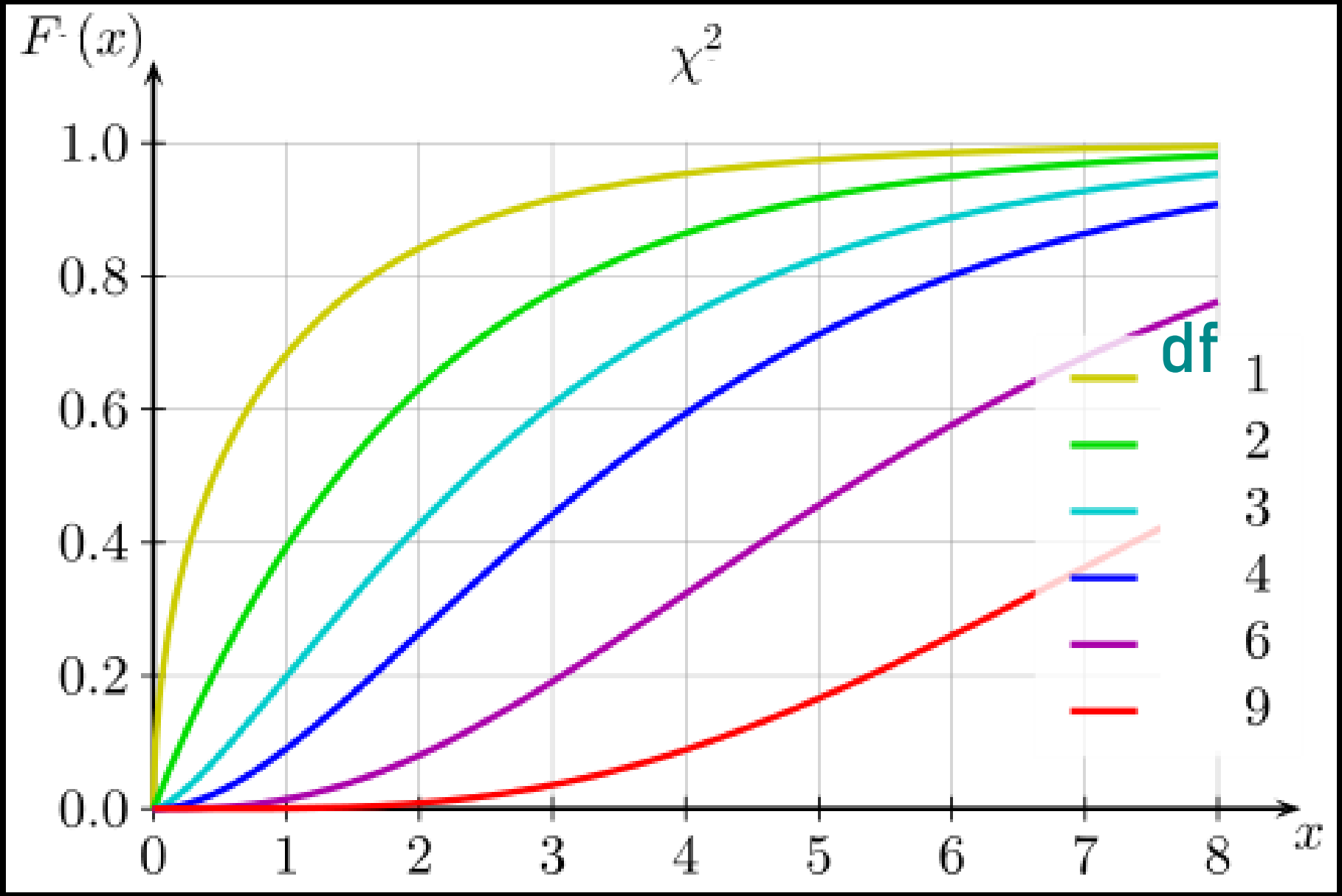
Paired/differential 2-sample tests



The chi2-test



The chi2-test



Quantiles de la loi khi–deux

ν	$q\chi^2_\nu(1\%)$	$q\chi^2_\nu(2{,}5\%)$	$q\chi^2_\nu(5\%)$	$q\chi^2_\nu(95\%)$	$q\chi^2_\nu(97{,}5\%)$	$q\chi^2_\nu(99\%)$
1	$0,0^3 1571$	$0,0^3 9821$	0,003932	3,841	5,024	6,635
2	0,02010	0,05064	0,1026	5,991	7,378	9,210
3	0,1148	0,2158	0,3518	7,815	9,348	11,34
4	0,2971	0,4844	0,7107	9,488	11,14	13,28
5	0,5543	0,8312	1,145	11,07	12,83	15,09
6	0,8721	1,237	1,635	12,59	14,45	16,81
7	1,239	1,690	2,167	14,07	16,01	18,48
8	1,646	2,180	2,733	15,51	17,53	20,09
9	2,088	2,700	3,325	16,92	19,02	21,67
10	2,558	3,247	3,940	18,31	20,48	23,21
11	3,053	3,816	4,575	19,68	21,92	24,72
12	3,571	4,404	5,226	21,03	23,34	26,22
13	4,107	5,009	5,892	22,36	24,74	27,69
14	4,660	5,629	6,571	23,68	26,12	29,14
15	5,229	6,262	7,261	25,00	27,49	30,58
16	5,812	6,908	7,962	26,30	28,85	32,00
17	6,408	7,564	8,672	27,59	30,19	33,41
18	7,015	8,231	9,390	28,87	31,53	34,81
19	7,633	8,907	10,12	30,14	32,85	36,19
20	8,260	9,591	10,85	31,41	34,17	37,57