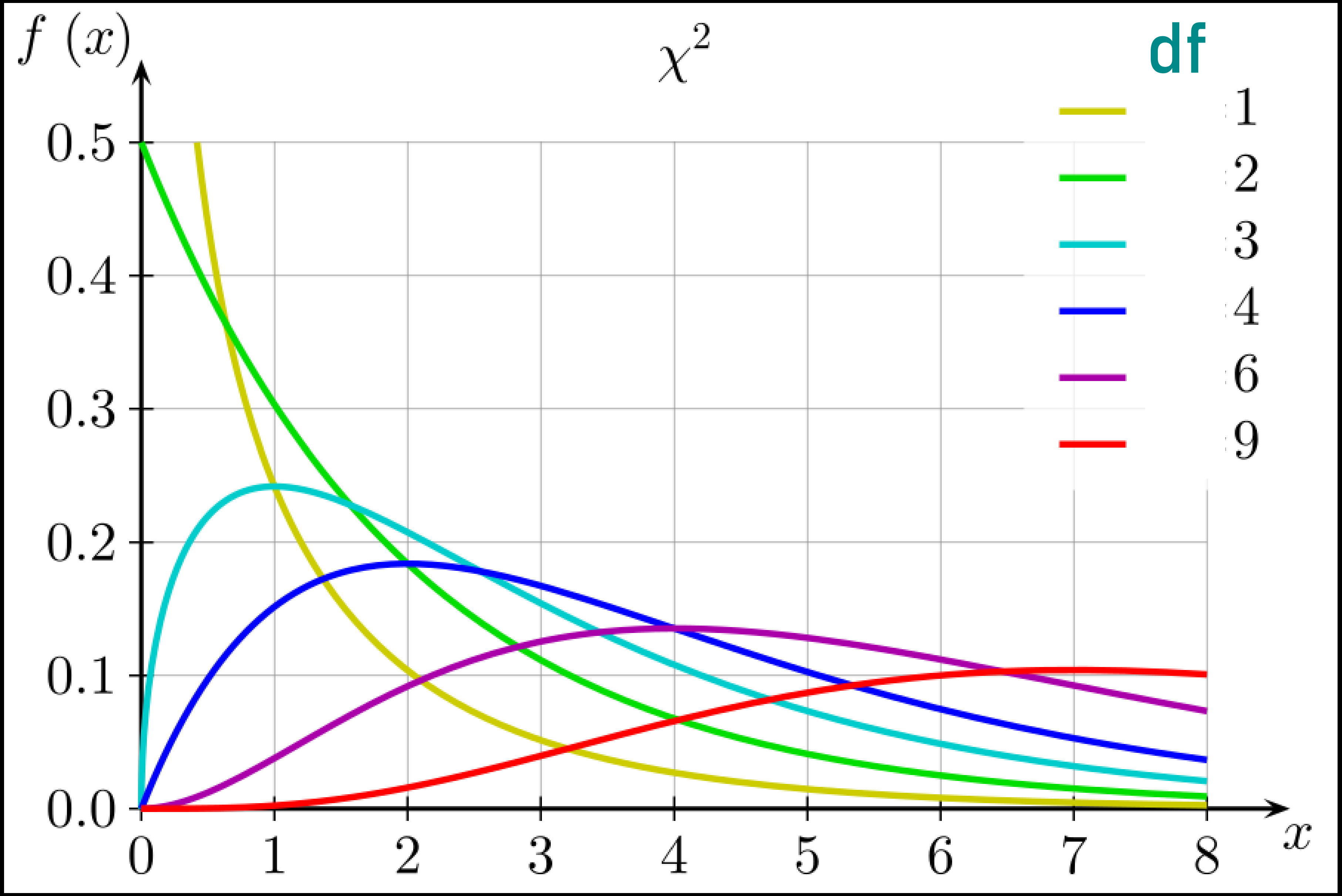
MSE-213
Probability and statistics for materials science
Lecture 9

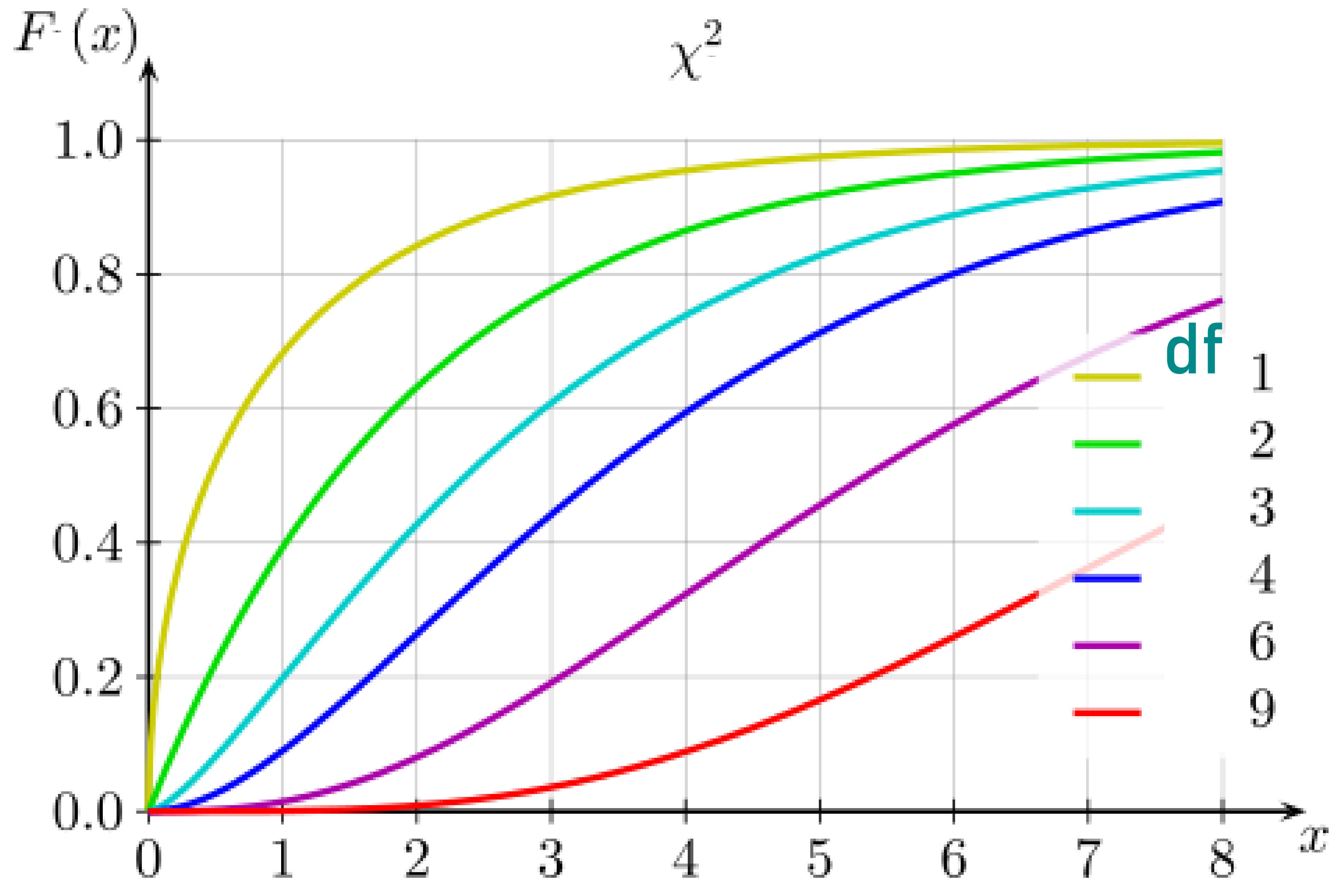
LECTURE NOTES WILL BE POSTED ONLINE

Recap

The chi2-test



The chi2-test



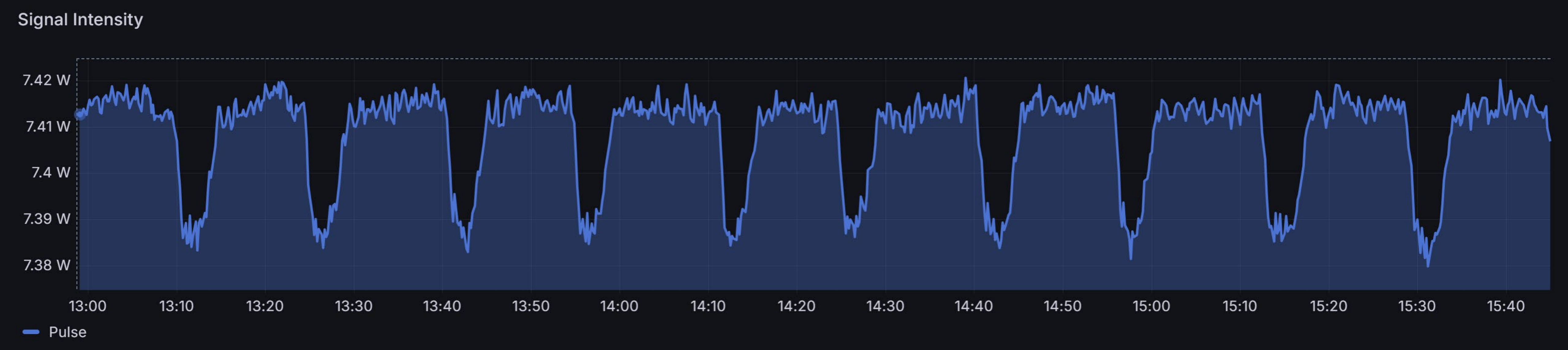
Quantiles de la loi khi–deux

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

Recap

ANOVA/Fisher test

ANOVA/Fisher test



Quantiles de la loi F_{ν_1,ν_2} de Fisher

	$\nu_1 = 1$	2	3	4	5	6	7	8	10	12	24	∞
$\nu_2 = 1$	161,4	199,5	215,7	224,6	230,2	234,0	236,8	238,9	241,9	243,9	249,1	254,3
2	18,51	19,00	19,16	19,25	19,30	19,33	19,35	19,37	19,40	19,41	19,45	19,50
3	10,13	9,552	9,277	9,117	9,013	8,941	8,887	8,845	8,786	8,745	8,639	8,526
4	7,709	6,944	6,591	6,388	6,256	6,163	6,094	6,041	5,964	5,912	5,774	5,628
5	6,608	5,786	5,409	5,192	5,050	4,950	4,876	4,818	4,735	4,678	4,527	4,365
6	5,987	5,143	4,757	4,534	4,387	4,284	4,207	4,147	4,060	4,000	3,841	3,669
7	5,591	4,737	4,347	4,120	3,972	3,866	3,787	3,726	3,637	3,575	3,410	3,230
8	5,318	4,459	4,066	3,838	3,687	3,581	3,500	3,438	3,347	3,284	3,115	3,928
9	5,117	4,256	3,863	3,633	3,482	3,374	3,293	3,230	3,137	3,073	2,900	2,707
10	4,965	4,103	3,708	3,478	3,326	3,217	3,135	3,072	2,978	2,913	2,737	2,538
11	4,844	3,982	3,587	3,357	3,204	3,095	3,012	2,948	2,854	2,788	2,609	2,404
12	4,747	3,885	3,490	3,259	3,106	2,996	2,913	2,849	2,753	2,687	2,505	2,296
13	4,667	3,806	3,411	3,179	3,025	2,915	2,832	2,767	2,671	2,604	2,420	2,206
14	4,600	3,739	3,344	3,112	2,958	2,848	2,764	2,699	2,602	2,534	2,349	2,131
15	4,543	3,682	3,287	3,056	2,901	2,790	2,707	2,641	2,544	2,475	2,288	2,066
16	4,494	3,634	3,239	3,007	2,852	2,741	2,657	2,591	2,494	2,425	2,235	2,010
17	4,451	3,592	3,197	2,965	2,810	2,699	2,614	2,548	2,450	2,381	2,190	1,960
18	4,414	3,555	3,160	2,928	2,773	2,661	2,577	2,510	2,412	2,342	2,150	1,917
19	4,381	3,522	3,127	2,895	2,740	2,628	2,544	2,477	2,378	2,308	2,114	1,878
20	4,351	3,493	3,098	2,866	2,711	2,599	2,514	2,447	2,348	2,278	2,082	1,843
21	4,325	3,467	3,072	2,840	2,685	2,573	2,488	2,420	2,321	2,250	2,054	1,812
22	4,301	3,443	3,049	2,817	2,661	2,549	2,464	2,397	2,297	2,226	2,028	1,783
23	4,279	3,422	3,028	2,796	2,640	2,528	2,442	2,375	2,275	2,204	2,005	1,757
24	4,260	3,403	3,009	2,776	2,621	2,508	2,423	2,355	2,255	2,183	1,984	1,733
25	4,242	3,385	2,991	2,759	2,603	2,490	2,405	2,337	2,236	2,165	1,964	1,711
26	4,225	3,369	2,975	2,743	2,587	2,474	2,388	2,321	2,220	2,148	1,946	1,691
27	4,210	3,354	2,960	2,728	2,572	2,459	2,373	2,305	2,204	2,132	1,930	1,672
28	4,196	3,340	2,947	2,714	2,558	2,445	2,359	2,291	2,190	2,118	1,915	1,654
29	4,183	3,328	2,934	2,701	2,545	2,432	2,346	2,278	2,177	2,104	1,901	1,638
30	4,171	3,316	2,922	2,690	2,534	2,421	2,334	2,266	2,165	2,092	1,887	1,622
32	4,149	3,295	2,901	2,668	2,512	2,399	2,313	2,244	2,142	2,070	1,864	1,594
34	4,130	3,276	2,883	2,650	2,494	2,380	2,294	2,225	2,123	2,050	1,843	1,569
36	4,113	3,259	2,866	2,634	2,477	2,364	2,277	2,209	2,106	2,033	1,824	1,547
38	4,098	3,245	2,852	2,619	2,463	2,349	2,262	2,194	2,091	2,017	1,808	1,527
40	4,085	3,232	2,839	2,606	2,449	2,336	2,249	2,180	2,077	2,003	1,793	1,509
60	4,001	3,150	2,758	2,525	2,368	2,254	2,167	2,097	1,993	1,917	1,700	1,389
120	3,920	3,072	2,680	2,447	2,290	2,175	2,087	2,016	1,910	1,834	1,608	1,254
∞	3,841	2,996	2,605	2,372	2,214	2,099	2,010	1,938	1,831	1,752	1,517	1,000

TABLE 5 – Les 95%-quantiles, $qF_{\nu_1,\nu_2}(95\%)$, des distributions F_{ν_1,ν_2}.

Quantiles de la

	$\nu_1 = 1$	2	3	4	5
$\nu_2 = 1$	161,4	199,5	215,7	224,6	230,2
2	18,51	19,00	19,16	19,25	19,30
3	10,13	9,552	9,277	9,117	9,013
4	7,709	6,944	6,591	6,388	6,256
5	6,608	5,786	5,409	5,192	5,050
6	5,987	5,143	4,757	4,534	4,387
7	5,591	4,737	4,347	4,120	3,972
8	5,318	4,459	4,066	3,838	3,687
9	5,117	4,256	3,863	3,633	3,482
10	4,965	4,103	3,708	3,478	3,326
11	4,844	3,982	3,587	3,357	3,204