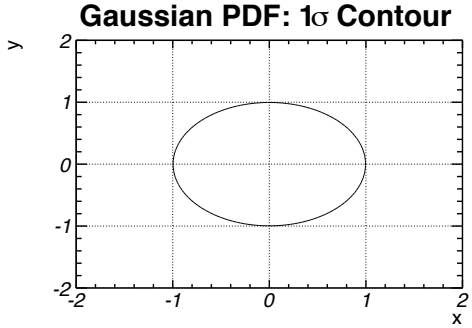
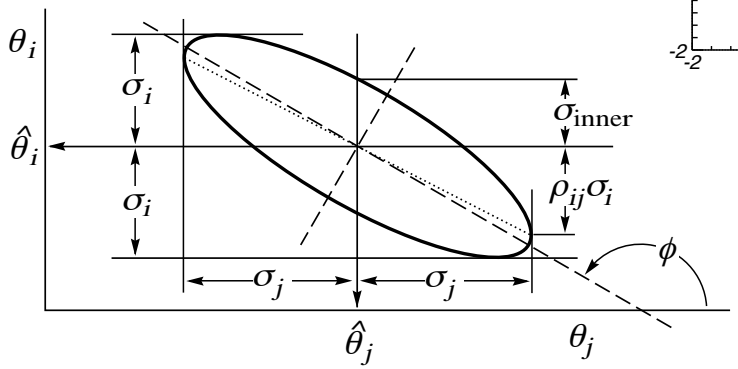
Statistical Methods of Data Analysis

Ulrich Husemann

Humboldt-Universität zu Berlin
Winter Semester 2010/2011

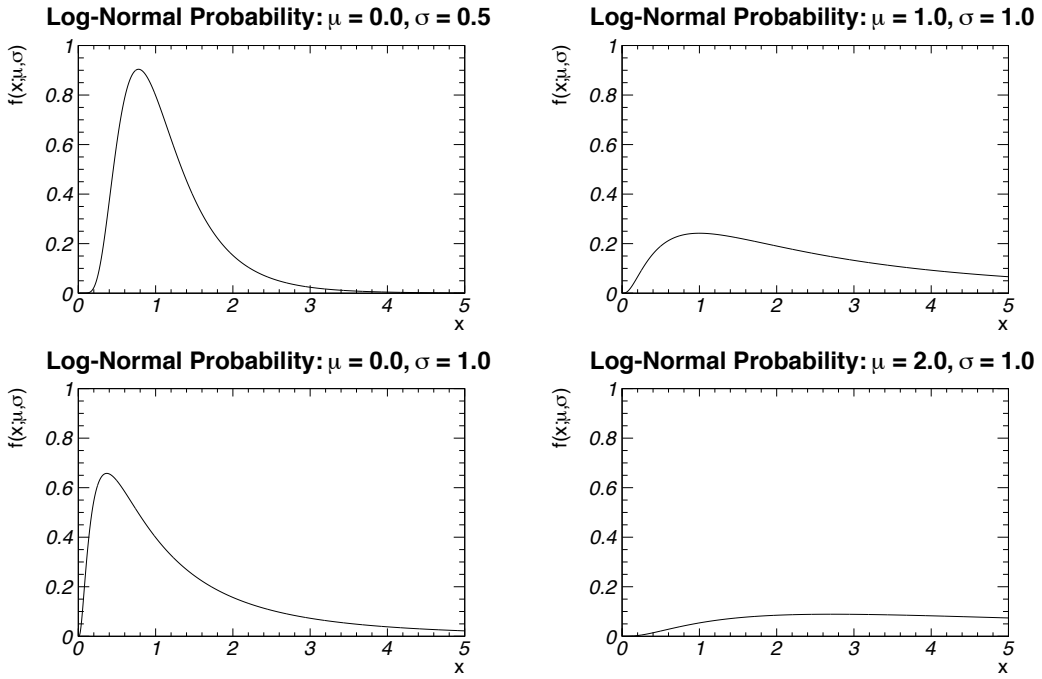
2D Gaussian PDF





[K. Nakamura et al. (Particle Data Group), J. Phys. G 37, 075021 (2010)]

Log-Normal Distribution



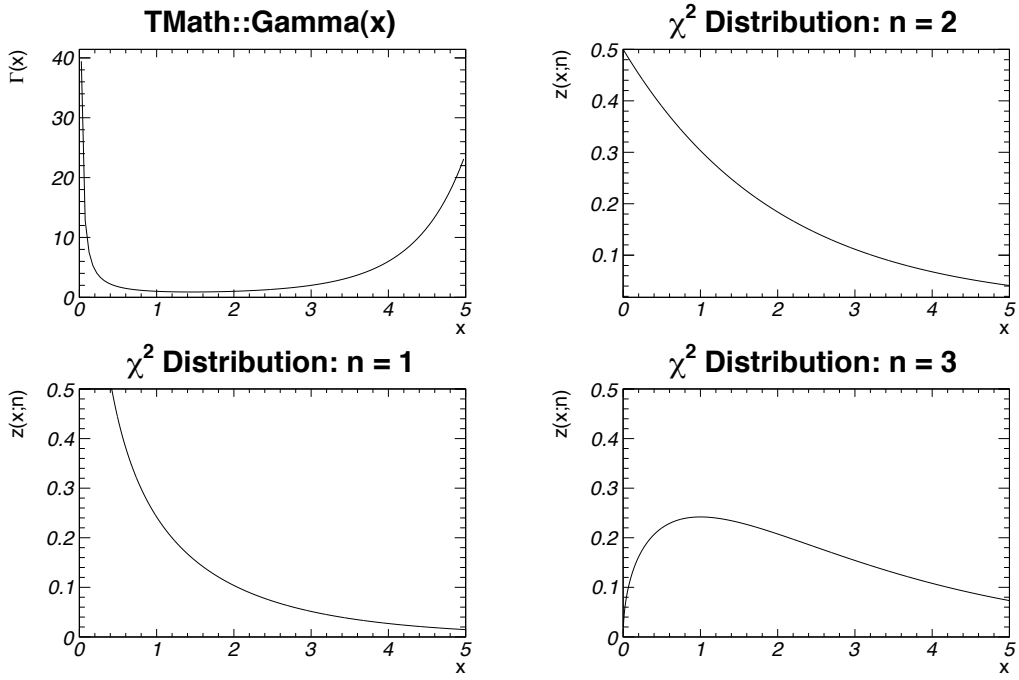
Log-Normal Distribution

Table 2. Comparing log-normal distributions across the sciences in terms of the original data. $\bar{x}*$ is an estimator of the median of the distribution, usually the geometric mean of the observed data, and s estimates the multiplicative standard deviation, the shape parameter of the distribution; 68% of the data are within the range of $\bar{x}*/s^*$, and 95% within $\bar{x}*/(s^*)^2$. In general, values of s* and some of $\bar{x}*$ were obtained by transformation from the parameters given in the literature (cf. Table 3). The goodness of fit was tested either by the original authors or by us.*

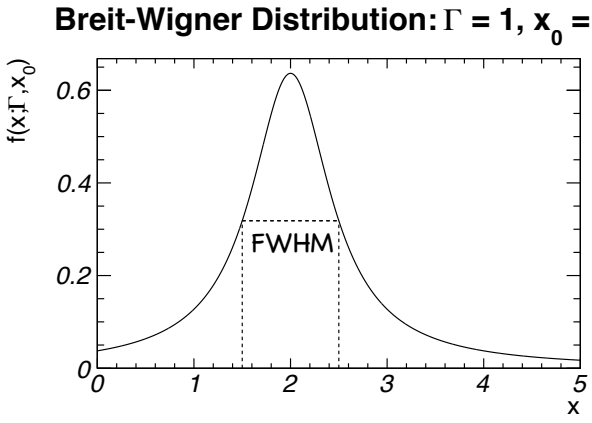
Discipline and type of measurement	Example	*n*	$\bar{x}*$	s*	Reference
Geology and mining					
Concentration of elements	Ga in diabase	56	17 mg · kg^{-1}	1.17	Ahrens 1954
	Co in diabase	57	35 mg · kg^{-1}	1.48	Ahrens 1954
	Cu	688	0.37%	2.67	Razumovsky 1940
	Cr in diabase	53	93 mg · kg^{-1}	5.60	Ahrens 1954
	^{226}Ra	52	25.4 Bq · kg^{-1}	1.70	Malanca et al. 1996
	Au: small sections	100	(20 inch-dwt.)[a]	1.39	Krige 1966
	large sections	75,000	n.a.	2.42	Krige 1966
	U: small sections	100	(2.5 inch-lb.)[a]	1.35	Krige 1966
	large sections	75,000	n.a.	2.35	Krige 1966
Human medicine					
Latency periods of diseases	Chicken pox	127	14 days	1.14	Sartwell 1950
	Serum hepatitis	1005	100 days	1.24	Sartwell 1950
	Bacterial food poisoning	144	2.3 hours	1.48	Sartwell 1950
	Salmonellosis	227	2.4 days	1.47	Sartwell 1950
	Poliomyelitis, 8 studies	258	12.6 days	1.50	Sartwell 1952
	Amoebic dysentery	215	21.4 days	2.11	Sartwell 1950
Survival times after cancer diagnosis	Mouth and throat cancer	338	9.6 months	2.50	Boag 1949
	Leukemia myelocytic (female)	128	15.9 months	2.80	Feinleib and McMahon 1960
	Leukemia lymphocytic (female)	125	17.2 months	3.21	Feinleib and McMahon 1960
	Cervix uteri	939	14.5 months	3.02	Boag 1949
Age of onset of a disease	Alzheimer	90	60 years	1.16	Horner 1987
Environment					
Rainfall	Seeded	26	211,600 m^3	4.90	Biondini 1976
	Unseeded	25	78,470 m^3	4.29	Biondini 1976
HMF in honey	Content of hydroxymethylfurfurol	1573	5.56 g kg^{-1}	2.77	Renner 1970
Air pollution (PSI)	Los Angeles, CA	364	109.9 PSI	1.50	Ott 1978
	Houston, TX	363	49.1 PSI	1.85	Ott 1978

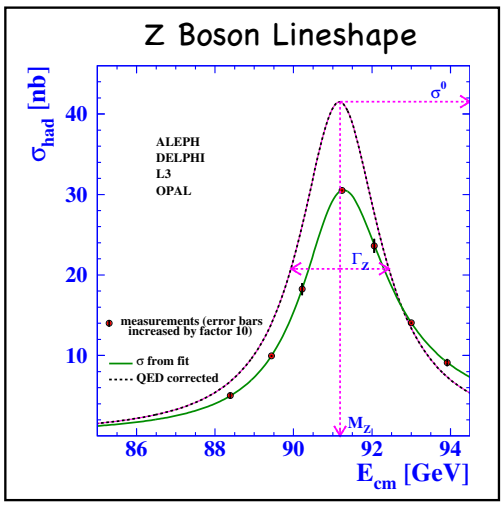
[E. Limpert, W.A. Stahel, M. Abbt, BioScience 51 (2001) 341]

Γ Function, χ^2 Distribution



Breit-Wigner Distribution





[LEP Electroweak Working Group, hep-ex/0612034]