

Jørgensen, Bent

Exponential dispersion models. (English) Zbl 0662.62078
J. R. Stat. Soc., Ser. B 49, 127-162 (1987).

A multidimensional extension of the generalized linear model of *P. McCullagh* and *J. A. Nelder* [Generalized linear models. (1983; Zbl 0588.62104)] is considered. These models, called exponential dispersion models, are defined by a family of probability measures denoted $P_{\lambda, \theta}$ such that there exists a measure P_λ with respect to which the density is

$$dP_{\lambda, \theta} / dP_\lambda = e^{\lambda \{y^\tau \theta - k(\theta)\}}, \quad y \in \mathbb{R}^k, \quad \text{and} \quad (\lambda, \theta) \in \Lambda \times \Theta.$$

The asymptotic properties of a weighted sum of such independent random variables are studied. The problems of inference in the case where λ is known or unknown are considered. The links with the model of Nelder and McCullagh are studied. Many examples are given and there is a large discussion given by 15 discussants.

Reviewer: J.-R.Mathieu

MSC:

- 62J99 Linear inference, regression
- 62E20 Asymptotic distribution theory in statistics
- 62H12 Estimation in multivariate analysis
- 62H15 Hypothesis testing in multivariate analysis

Cited in **3** Reviews
Cited in **121** Documents

Keywords:

moment generating function; asymptotic normality; Poisson; binomial; negative binomial; normal; gamma; inverse Gaussian distributions; combinations; compound distributions; convolution; exponential families; longitudinal data; mixtures; power variance functions; small-dispersion asymptotics; stable distribution; variance components; variance functions; generalized linear model; exponential dispersion models; examples