

Methods of Constructing Characterizations by Constancy of Regression on the Sample Mean and Related Problems for NEF's

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Abstract—Characterizations of a distribution by zero (or constant) regression properties of arbitrary degree polynomial statistics on the sample mean are discussed. Various practical steps collected from the relevant literature are put together in this framework into a comprehensive guideline for constructing such characterizations. Applications are provided for natural exponential families (NEF's). In particular, two reciprocal NEF's associated with the continuous time symmetric Bernoulli random walk are characterized using this guideline. Moreover, a class of infinitely divisible NEF's having some polynomial variance function structure is discussed in this framework.

Key words: characterizations, constant regression, natural exponential family, variance function.

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