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二项-广义 Pareto 复合极值分布模型的统计推断

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Statistical Inference for Binomial-generalized Pareto Compound Extreme Value Distribution Model

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摘要 极值理论主要研究小概率、大影响的极端事件. 当前, 复合极值分布已经广泛应用于水文、 气象、地震、保险、金融等领域. 本文以极值类型定理和PBDH定理为理论依据, 构建了二项-广义Pareto复合极值分布模型; 使用概率加权矩方法, 对所建立的复合模型推导参数估计式; 利用计算机模拟, 得到了Kolmogorov-Smirnov (简称KS)检验统计量的临界值.

关键词： 广义Pareto分布 二项分布 概率加权矩 Anderson-Darling(AD)检验 KS检验 次序统计量 随机模拟

Abstract： Extreme value theory is mainly the study on extreme events of small probability & major impact. At present, the compound extreme value distribution has been widely used in hydrology, meteorology, earthquake, insurance, finance and other fields. In this paper, we establish binomial-generalized Pareto compound extreme value distribution model based on extreme value type theorem and PBDH theorem, derive parameter estimation of the established compound model by probability weighted moments, get critical values of Kolmogorov-Smirnov test statistic.

Key words： generalized Pareto distribution Binomial distribution probability weighted moment Anderson-Darling test Kolmogorov-Smirnov test order statistic random simulation

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