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Estimation of the degree of agreement of empirical random vectors using central moment functions

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Estimation of the degree of agreement of empirical random vectors using central moment functions.

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A methodology for estimating the degree of agreement M of empirical random vectors (RV):ν(k)=□(ν□*0,ν_1,…,ν_l)*
of frequenciesν_i (k=i) of counts k of registered particles by samples of small volume
Σ_0ˆl□□ν_i=n<20□,0≤ν_i≤n
and average (k)¯<5 was developed.
The degree of agreement of the vectors is estimated by the test statistics of the closeness of the projections of the fractional order functions 1<S of the central moments μ(ν(k),S) RV– ν:
μ(ν,S)=1/(n-1) Σ_1ˆl□□(k_i-k¯)ˆS=Re(S,μ(.)) □+i·Im(S,μ(.)),iˆ2=-1,
Where Re(.) and Im(.) is real and imaginary components of the central moments function 1<S. As a test statistic to estimate the agreement of projections μ(S) there was proposed a metric
Φ=Σ(S_0=0)ˆS□□(((Re(μ_(1,g))-Re(μ_(1,h))))/((Re(μ_(1,g))+Re(μ_(1,h)))))*iˆ2+(((Im(μ*(1,g))-Im(μ_(1,h))))/((Im(μ_(1,g))+Im(μ_(1,h)))))_iˆ2 □·
·1/(S_m-S_0)
The methodology is based on the mutual one-to-one correspondence of the random vector ν(.)=□(ν□_0,ν_1,…,ν_l),Σ_0ˆl□□ν_i=n<20□,ν_i (k=j), in the sample and the complex function of fractional order 1<S_0<S_m≤5 of central moment of vector ν(.).

References
Bliznyakov N. M., Vakhtel V. M., Kostomakha D. E., Rabotkin V. A., "Modern methods of the theory of functions and related problems", Proceedings of an international conference, Voronezh: -VSU. 2021. p. 55-57.

The speaker is a student or young scientist

No

Section

1. Applications of nuclear methods in science and technology

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