MINISTRY OF HIGHER AND SECONDARY SPECIAL EDUCATION
OF THE REPUBLIC OF UZBEKISTAN

NATIONAL UNIVERSITY OF UZBEKISTAN

UZBEKISTAN ACADEMY OF SCIENCES
V.I.ROMANOVSKIY INSTITUTE OF MATHEMATICS

FERGANA STATE UNIVERSITY

INTERNATIONAL ENGINEERING ACADEMY

ABSTRACTS

OF THE VII INTERNATIONAL SCIENTIFIC CONFERENCE
CONFERENCE

MODERN PROBLEMS OF APPLIED MATHEMATICS AND INFORMATION TECHNOLOGIES AL-KHWARIZMI 2021

**dedicated to the 100th anniversary of the academician
Vasil Kabulovich Kabulov**

15-17 November, 2021, Fergana, Uzbekistan

ON THE HOMOTOPY PROPERTIES OF THE SPACE OF PROBABILITY MEASURES

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In this note, for functors P_n and P_ω [1] , in the category of compacts and continuous mappings in itself, the following holds:

Theorema 1. For any infinite compactum X and for any $n \in N$ subspace there $P_n(X)$ is Z-a set in $P_\omega(X)$.

Proof. Let X an infinite compact set and $n \in N$. For any $\varepsilon > 0$ $f_\varepsilon : P_\omega(X) \setminus P_n(X) \longrightarrow P_\omega(X) \setminus P_n(X)$, $f_\varepsilon(\mu) = (1-\varepsilon)\cdot\mu + \varepsilon\cdot\mu_0$, $\mu_0 \in P_\omega(X) \setminus P_n(X)$

$$\mu_0 = m_1\delta_{x_1} + m_2\delta_{x_2} + ... + m_{n+2}\delta_{x_{n+2}},\ \ supp\mu_0 = \{x_0,\, x_1,\, x_2,\, ...,\, x_n\}.$$

$$|f_\varepsilon(\mu) - \mu| = |(1-\varepsilon)\mu + \varepsilon\mu_0 - \mu| = |\mu - \varepsilon\mu + \varepsilon\mu_0 - \mu| = |\mu_0 - \mu|\cdot\varepsilon.$$

$f_\varepsilon(P_\omega(X)) \cap P_n(X) = \emptyset$ and $\left(f_\varepsilon, id_{P_\omega(X)}\right)(U)$ for each $U \in cov(P_\omega(X))$.

Let us U assume some family of subsets of the space X. We say that two mapping $f, g : Y \longrightarrow X$, U – are closed (we write $(f,g)(U)$, if for $y \in Y$ each $f(y) \neq g(y)$ and $U \in U$, $f(y)$, $g(y) \in U$). Denote $cov(X)$ by the family of all open covered spaces X.

The following equivalent definition of space sets is Z – sometimes used X. A set A of space X is called a (strong) Z – set in X, if it A is closed and for each cover $U \in cov(X)$ there is such a mapping $f : X \to Y$ as $(f, id_X) < U$ $f(X) \cap A = \emptyset$ (respectively, $cl_X f(A) \cap A = \emptyset$).

Hence, $P_n(X)$ there is Z-a set in $P_\omega(X)$. The theorem is proved. The paper [2] has the following

Theorema 2. Let A a topologically complete subset ANR of the space X which is $A = \bigcup_{n=1}^{\infty} A_n$ and A_n Z – is a set in X. Then A there is the Z-a – set in X.

References

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