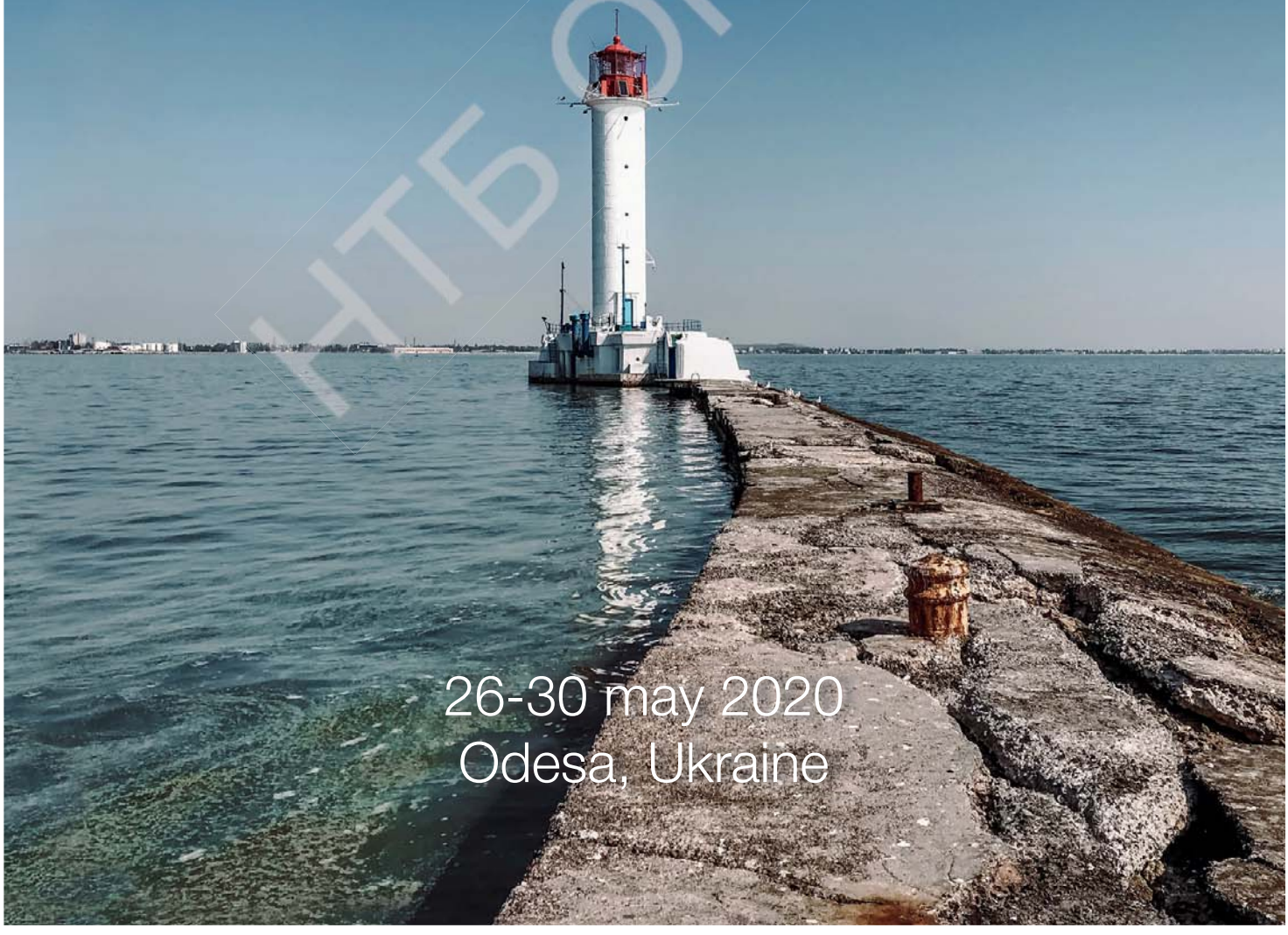
International
Scientific Conference

Algebraic and Geometric Methods of Analysis



26-30 may 2020
Odesa, Ukraine

List of topics

- Algebraic methods in geometry
- Differential geometry in the large
- Geometry and topology of differentiable manifolds
- General and algebraic topology
- Dynamical systems and their applications
- Geometric problems in mathematical analysis
- Geometric and topological methods in natural sciences

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Fejer Sums and the von Neumann Ergodic Theorem

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The Fejér sums of periodic measures and the norms of the deviations from the limit in the von Neumann ergodic theorem are calculated, in fact, using the same formulas (by integrating the Fejér kernels), so this ergodic theorem is a statement about the asymptotics of the growth of the Fejér sums at zero for the spectral measure of the corresponding dynamical system.

As a result, well-known estimates for the rates of convergence in the von Neumann ergodic theorem can be restated as estimates of the Fejér sums at the point for periodic measures. For example, natural criteria for the polynomial growth and polynomial decrease in these sums can be obtained.

On the contrary, available in the literature, numerous estimates for the deviations of Fejér sums at a point can be used to obtain new estimates for the rate of convergence in this ergodic theorem. For example, for many dynamical systems popular in applications, the rates of convergence in the von Neumann ergodic theorem can be estimated with a sharp leading coefficient of the asymptotic by applying S.N. Bernstein's more than hundred-year old results in harmonic analysis.

References

[1] Alexander G. Kachurovskii, Kirill I. Knizhov. Deviations of Fejer Sums and Rates of Convergence in the von Neumann Ergodic Theorem. *Dokl. Math*, 97(3) : 211–214, 2018.

[2] Alexander G. Kachurovskii, Ivan V. Podvigin. Fejer Sums for Periodic Measures and the von Neumann Ergodic Theorem *Dokl. Math.*, 98(1) : 344–347, 2018.

Зміст