The poster will be devoted to several problems of uniform approximability of functions by polyanalytic functions and by solutions of homogeneous elliptic equations with constant complex coefficients on compact subsets of the plane.

Let L be a homogeneous elliptic operator in $\mathbb{C}$ with constant complex coefficients. One says, that a function f is called L-analytic on an open set $U \subset \mathbb{C}$ if $Lf = 0$ in U; a polynomial p is called L-polynomial if $Lp = 0$ everywhere in $\mathbb{C}$.

We are interested in the following approximation problem: *to find out a necessary and sufficient conditions on a compact set $X \subset \mathbb{C}$ in order that each function which is continuous on X and L-analytic on its interior can be uniformly on X approximated by L-polynomials or by L-analytic functions with localized singularities.*

In last decade a number of general results concerning this problem have been obtained. The corresponding necessary and sufficient conditions for the possibility of the approximation were stated in terms of the related capacities as well as in certain geometric, metric or special analytic terms. In many instances, these results have a reductive nature, which means that the approximation on a compact set X holds whenever we have the approximation on some appropriately chosen compact subsets of X.

One of the most interesting and important cases in this field is the approximation by polyanalytic functions (when $L = \bar{\partial}^n$ where $n \in \mathbb{N}$ and $\bar{\partial}$ denotes the standard Cauchy-Riemann operator). Some results concerning this subject may be found in [1].

In the poster it is planned to discuss the recent progress and some open problems in the field under consideration.

References

[1] *Carmona J.J., Fedorovskiy K.Yu., Paramonov P.V.* On uniform approximation by polyanalytic polynomials and the Dirichlet problem for bianalytic functions. Sb. Math. 2002. 193 (10), 1469–1492.