On the deformation of complex structures on vector bundles on Riemann surfaces

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In the talk, we consider the connection between the following three spaces: the space of complex structures on the Riemann surface $CP^1 - \{s_1, ..., s_m\}$, the space of Fuchsian systems of differential equations with singularities at the points $s_1, ..., , s_m$, and the configuration space of n-gons in the three-dimensional Euclidean space. In recent years, these spaces were intensively studied, and methods of their investigation are various.In this direction, important results were obtained. First, it was proved that the monodromy representations, for which the Riemann-Hilbert monodromy problem has a positive solution, are dense in the space of all representations of the fundamental group of $CP^1 - \{s_1, ..., s_m\}$, and second, the Schlesinger theorem on the isomonodromic deformation of singular points of Fuchsian systems is known. We shall calculate the Euler characteristics of the corresponding compactified manifolds and use this result for the calculation of the Euler characteristic of manifolds that arise from analytical problems.

We give an overview of known results on the topology of these manifolds and describe our approach, which is based on the signature formulas of the topological degree of a map (see [1], [2], [3]).

References

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