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Perturbations of Algebras of Operators

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In 1972, Kadison and Kastler initiated a study of perturbations of von Neumann algebras. They defined the distance between algebras of operators, acting on the same Hilbert space as the Hausdorff distance between their unit balls. They asked if two von Neumann algebras are isomorphic or even spatially isomorphic (unitarily equivalent) if they are sufficiently near to each other. The founding article by Kadison and Kastler showed that the type of a von Neumann algebra is stable under perturbations and soon after John Phillips and I, independently, answered the question in the positive for type I von Neumann algebras.

Since then various people have continued the investigation, and many results verify that especially von Neumann algebras are rigid with respect to perturbations, but also nuclear C*-algebras behave nicely in this respect. I will report on some of the problems this question has raised and tell about some recent progresses too.

References

1. R. V. Kadison, Daniel Kastler, Perturbations of von Neumann algebras, I stability of type, Amer. J. Math., 94 (1972), 38-54.
2. John Phillips, Perturbations of type I von Neumann algebras, Pacific J. Math. 52 (1974), 505-511.
3. Erik Christensen, Perturbations of type I von Neumann algebras, J. London Math. Soc. (2), 9 (1975), 395-405.