UNIVERSITÄT DUISBURG ESSEN

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Local Spectral Statistics in the Complex Spectral Bulk of Non-Hermitian Systems

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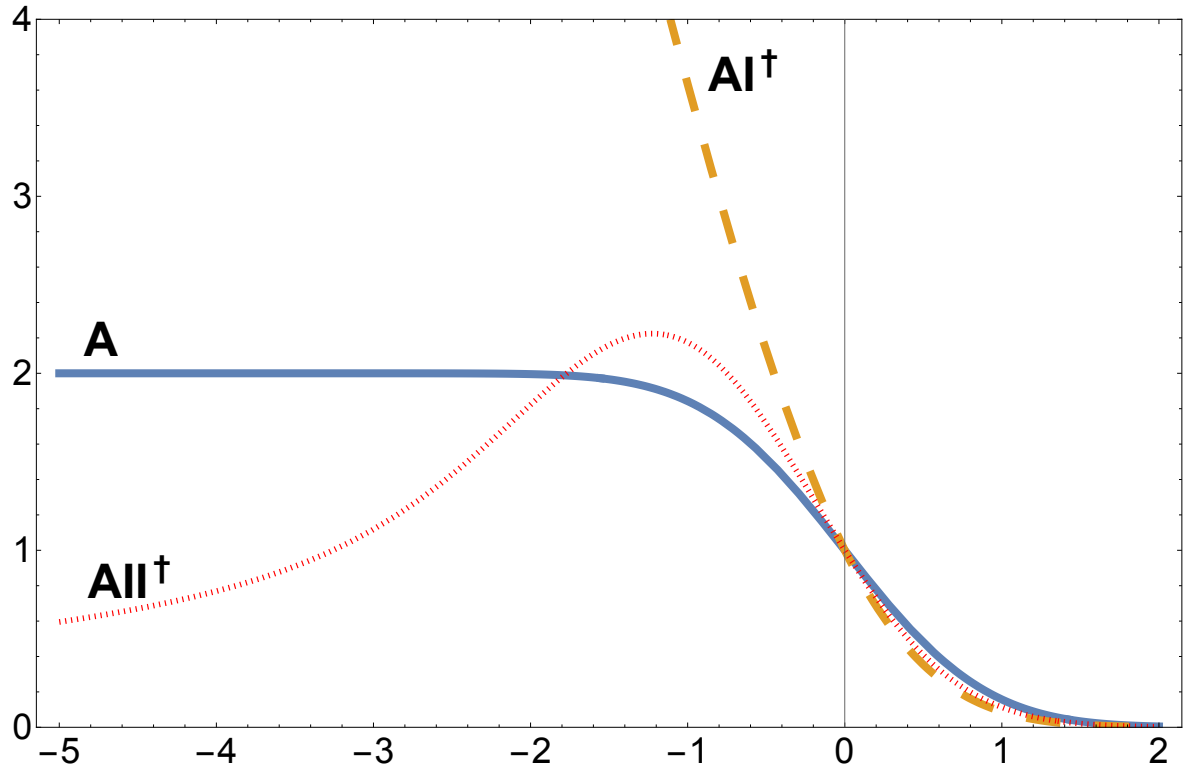

Universality of eigenvalue statistics is one of the main reasons why random matrix theory applies extremely well to physical quantum systems exhibiting chaotic behaviour. In the past decade, open quantum systems shifted into the focus of many studies and with it also non-Hermitian versions of Hamilton, Dirac or Lindblad operators. With this change new challenges and conjectures have arisen. One is a symmetry classification of non-Hermitian operators in the form of Altland-Zirnbauer's ten-fold way. Those are physically important as each of the symmetry classes exhibit unique topological properties. Originating from this classification came the question whether one can identify the symmetry class when considering the local spectral statistics as it has been the case for Hermitian operators, nowadays known as Wigner's surmise. Numerical studies have shown that a three-fold classification of the statistics for the complex eigenvalues in the bulk seems to be present though an analytical computation is very challenging. Together with Gernot Akemann, Noah Aygun and Patricia Päßler, we have identified an observable where such an analysis is feasible and for which we have confirmed the numerical observations. I will report about this in my talk.