Rank two perturbations of operators and matrices

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The rank one perturbations have gained recently much attention. In its simplest version, the problem can be formulated as follows. Suppose that A is a matrix with some given spectrum and Jordan structure. What is then the spectrum of a rank one perturbation $A + uv^*$?
The problem may be considered in many variations. Frequently it is assumed that the matrix A has a special structure of entries (e.g. real symmetric matrix or Hamiltonian matrix) or one may consider a linear pencils $A + zE$. Another step forward is to consider rank two perturbations.
The motivation for this research comes from many sources. For example, in numerical analysis many backward errors are modeled with rank one matrices. Furthermore, when modeling an electrical RCL circuit we get linear pencil with a special structure of entries. Changing one parameter of the circuit (e.g. one of the resistors, capacitors or inductors) leads usually to rank two perturbations of the pencil.
In the talk beside elaborating on the motivations we will discuss current results on rank two perturbations of matrices and operators (joint work with A. Kula and J. Wysoczanski, Wroclaw University), paying some attention to problems appearing in the infinite dimensional setting.