Title: Amplitudes from eigenvalues

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A dynamical system is generally understood, first, via linear stability analysis, which reduces to the diagonalization of a matrix, then followed by the saturation of the instability by its nonlinear terms.
Surprisingly, in many cases of interest, the nonlinear analysis can also be reduced to the diagonalization of a matrix (similar to the linear stability matrix) whose eigenvalues yield nonlinear amplitudes. This provides an complementary alternative to the usual unfolding of
codimension-two points. Examples of such systems occur in binary fluid convection, cylindrical or rotating convection, and in dynamo reversals.