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Singularly Perturbed Elliptic Equations

(2 Lectures)

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The blow up phenomena for singularly perturbed elliptic equations allows one to construct and describe solutions when the parameter is close to its critical values. I will explain the main ideas behind the construction of such solution. The construction involves the use of weighted spaces and some nonlinear version of Cauchy data mapping. It can be applied to the Ginzburg-Landau system, semilinear elliptic problems with nearly critical Sobolev nonlinearity, prescribed scalar curvature problem, Liouville type equations, ...