Meunier, N.; **Sanchez-Palencia, E.**

Sensitive versus classical singular perturbation problem via Fourier transform. (English)

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The authors study a class of singular perturbation elliptic boundary value problems depending on a parameter ε which are classical for $\varepsilon > 0$ but highly ill-posed for $\varepsilon = 0$ as the boundary condition does not satisfy the Shapiro-Lopatinskii condition. The asymptotic process exhibits a complexification phenomenon: the solution becomes more complicated as ε decreases, and the limit does not exist in classical distribution theory. This phenomenon is associated with the emergence of the new characteristic parameter $|\log \varepsilon|$.

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MSC:

35B25 Singular perturbations in context of PDEs
35R25 Ill-posed problems for PDEs
35B40 Asymptotic behavior of solutions to PDEs

Keywords:

singular perturbation; Fourier transform; elliptic boundary value problem

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