

Maximum and antimaximum principles: beyond the first eigenvalue

J.-P. Gossez (Bruxelles)

Consider the Dirichlet problem

$$-\Delta u = \mu u + f \text{ in } \Omega, \quad u = 0 \text{ on } \partial\Omega,$$

with Ω a smooth bounded domain in \mathbb{R}^N . The well-known maximum and antimaximum principles give informations on the sign of the solution u when the parameter μ varies near the first eigenvalue λ_1 of the corresponding homogenous problem. Our purpose in this talk is to introduce an analogue of these two principles when μ varies near a higher eigenvalue λ_k . Nodal domains play a central role in our study, as well as, in some cases, the Payne conjecture relative to the nodal line of a second eigenfunction in the plane. (Joint work with J. Fleckinger and F. de Thélin from Toulouse, France).