

# ON DEFORMATIONAL SPECTRAL RIGIDITY OF CONVEX SYMMETRIC PLANAR DOMAINS

VADIM KALOSHIN

One can associate to a planar convex domain  $\Omega \subset \mathbb{R}^2$  two types of spectra: the Laplace spectrum consisting of eigenvalues of a Dirichlet problem and the length spectrum consisting of perimeters of all periodic orbits of a billiard problem inside  $\Omega$ . The Laplace and length spectra are closely related, generically the first determines the second. M. Kac asked if the Laplace spectrum determines a domain  $\Omega$ . There are counterexamples. During the talk we show that a planar axis symmetric domain close to the circle can't be smoothly deformed preserving the length spectrum unless the deformation is a rigid motion. This gives a partial answer to a question of P. Sarnak. This is a joint work with J. De Simoi and Q. Wei. In a different direction we show that generically the "minimal" length spectrum determines eigenvalues of minimal periodic orbits. This is a joint work with Guan Huang and Alfonso Sorrentino.