Stability of the Hersch inequality for the first eigenvalue on the 2-sphere and generalizations

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Abstract. Stability questions for sharp inequalities are important problems in analysis. Recently, these questions have been investigated for the first eigenvalue of the Laplacian on Euclidean domains. Optimal stability estimates for Faber-Krahn and Szego-Weinberger inequalities were obtained by Brasco-De Philippis-Velichkov and Nadirashvili, Brasco-Pratelli respectively. In the present talk we briefly survey their results and then focus on the stability of another fundamental inequality in spectral geometry: Hersch inequality for the first eigenvalue on the 2-dimensional sphere. Furthermore, we discuss generalizations to other surfaces and the connection to harmonic maps and minimal surfaces. Based on the joint work with M. Nahon, I. Polterovich and D. Stern.