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Existence and regularity of maximal metrics for the Laplace eigenvalues on surfaces

Résumé/Abstract: Given a compact surface, we deal with an old question (since the works by Yang and Yau in the 80s) about the sequence of the eigenvalues of the Laplacian : Is there some regular Riemannian metric which maximises the  $k$ -th eigenvalue on this surface ? We also give the link between this problem and minimal immersions into spheres