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*Existence of metrics maximizing the first eigenvalue on closed surfaces*

**Abstract**

We show that on each closed surface of fixed topological type, orientable or non-orientable, there is a metric, smooth away from finitely many conical singularities, that maximizes the first eigenvalue among all unit volume metrics. The key new ingredient are several monotonicity results relating the corresponding maximal eigenvalues. This is joint work with Anna Siffert.