Mathematics > Spectral Theory

The Hessenberg matrix and the Riemann mapping

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(Submitted on 29 Jul 2011 (v1), last revised 6 Nov 2011 (this version, v2))

We consider a Jordan arc \Gamma in the complex plane \mathbb{C} and a regular measure \mu whose support is \Gamma . We denote by D the upper Hessenberg matrix of the multiplication by z operator with respect to the orthonormal polynomial basis associated with \mu . We show in this work that, if the Hessenberg matrix D is uniformly asymptotically Toeplitz, then the symbol of the limit operator is the restriction to the unit circle of the Riemann mapping function \phi(z) which maps conformally the exterior of the unit disk onto the exterior of the support of the measure \mu . We use this result to show how to approximate the Riemann mapping function for the support of \mu from the entries of the Hessenberg matrix D.

Subjects: **Spectral Theory (math.SP)**; Complex Variables (math.CV); Functional Analysis (math.FA)

Cite as: **arXiv:1107.6036 [math.SP]**

(or **arXiv:1107.6036v2 [math.SP]** for this version)

Submission history

From: M. Asuncion Sastre [view email]

[v1] Fri, 29 Jul 2011 18:42:10 GMT (1851kb)

[v2] Sun, 6 Nov 2011 20:00:43 GMT (1850kb)

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