

Caltech Mathematical Physics Seminar
Winter 2008–09

Szegő Asymptotics for Matrix-valued Measures With Countably Many Bound States

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Abstract. Let μ be a matrix-valued measure with $\text{ess supp } \mu = [-2, 2]$ and countably many point masses $\{E_j\}_{j=1}^\infty$ outside $[-2, 2]$. Assume the Szegő condition $\int_{-2}^2 (4-x^2)^{-1/2} \log \det \mu'_{\text{a.c.}}(x) dx > -\infty$ holds, and $\{E_j\}_{j=1}^\infty$ satisfy the Blaschke-type condition $\sum_{j=1}^\infty (|E_j| - 2)^{1/2} < \infty$. Then Szegő asymptotics for the orthogonal polynomials holds.

The result generalizes the scalar analogues of Peherstorfer–Yuditskii (2001) and Killip–Simon (2003), and the matrix-valued result of Aptekarev–Nikishin (1983).