The Determinant Method for Periodic Sturm-Liouville Problems

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We would like to use the basic properties of determinants of infinite matrices of trace class to compute eigenvalues of periodic Sturm Liouville operators. Lidskii's theorem expresses the determinant as an entire function that can be approximated by the finite section method. Thus we can compute the eigenvalues in a very simple way, numerical integration is minimized and no shooting is required to match boundary conditions. In fact the algorithm can deal with operators with nowhere differentiable coefficients and we also obtain an upper bound on the truncation error. Several examples are used to test the new method.