

# A Schauder and Riesz basis criterion for non-self-adjoint Schrödinger operators with periodic and antiperiodic boundary conditions

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Under the assumption that  $V \in L^2([0, \pi]; dx)$ , we derive necessary and sufficient conditions for (non-self-adjoint) Schrödinger operators  $-d^2/dx^2 + V$  in  $L^2([0, \pi]; dx)$  with periodic and antiperiodic boundary conditions to possess a Riesz basis of root vectors, i.e., eigenvectors and generalized eigenvectors spanning the range of the Riesz projection associated with the corresponding periodic and antiperiodic eigenvalues.

We also discuss the case of a Schauder basis for periodic and antiperiodic Schrödinger operators  $-d^2/dx^2 + V$  in  $L^p([0, \pi]; dx)$ ,  $p \in (1, \infty)$ .

This is a joint work with Fritz Gesztesy. The detailed exposition of our results has been recently published in *Journal of Differential Equations*, 253 (2012), 400-437.