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Zoi Rapti* (zrapti@math.uiuc.edu), Department of Mathematics, University of Illinois at Urbana-Champaign, 1409 W. Green Street, Urbana, IL 61801, and **Jared C Bronski**. *Counting defect eigenvalues via the Evan's function.*

We consider the problem of a Schrödinger equation with a potential consisting of a periodic part plus a compactly supported defect potential. We are studying the emergence of eigenvalues into the gaps of the essential spectrum, and in particular we are counting the number of such eigenvalues. We analyse the one-dimensional problem, for which an Evan's function can be defined, whose zeros correspond to the eigenvalues in the gaps. Using a homotopy argument, we are then able to count the eigenvalues as they emerge. (Received February 05, 2006)