1011-58-367   **Carolyn S Gordon*** (`csgordon@dartmouth.edu`), Department of Mathematics, Dartmouth College, 6188 Bradley, Hanover, NH 03755, and **Pierre Guerini**, **Thomas Kappeler** and **David L Webb**. *Inverse spectral results on even dimensional tori.*

Given a Hermitian line bundle L over a flat torus M, a connection ∇ on L, and a function Q on M, one associates a Schrödinger operator acting on sections of L. In the case of line bundles of Chern number one over two-dimensional tori for which both the connection and the potential are even, V. Guillemin showed under genericity conditions that the spectrum determines both the connection and the potential. We address the question in higher even dimensions of whether, fixing an "invariant" connection, the spectrum determines the potential. With a genericity condition, we show that the spectrum determines the even part of the potential. We also show that the collection of all the spectra $Spec(Q; L, \nabla)$ as ∇ varies over the invariant connections, uniquely determines the potential, without any assumption of evenness. This collection of spectra is a natural analog in the case of line bundles to the classical Bloch spectrum of the torus.

We also obtain counterexamples showing that the genericity conditions are needed even in the case of the two-dimensional tori studied by Guillemin. (Received August 30, 2005)

1