

INTEGRABILITY AND REGULARITY OF RATIONAL FUNCTIONS

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Motivated by recent work in the mathematics and engineering literature, we study integrability and non-tangential regularity on the two-torus for rational functions that are holomorphic on the bidisk. One way to study such rational functions is to fix the denominator and look at the ideal of polynomials in the numerator such that the rational function is square integrable. A concrete list of generators is given for this ideal as well as a precise count of the dimension of the subspace of numerators with a specified bound on bidegree. The dimension count is accomplished by constructing a natural pair of commuting contractions on a finite dimensional Hilbert space and studying their joint generalized eigenspaces.