# ON OPERATORS IN THE COWEN-DOUGLAS CLASS AND HOMOGENEITY

PRAHLLAD DEB

Abstract. In classical operator theory, a large class of operators of interest possess a relatively "thin" spectrum. This class encompasses all operators on a finite dimensional Hilbert space whose spectrums are finite subsets of the complex plane. For infinite dimensions as well, there are operators possessing "thin" spectrum, for instances, the compact normal operators (whose spectrums are countable discrete subsets of the complex plane), self-adjoint or hermitian operators (whose spectrums are contained in the real line) and unitary operators (whose spectrums are subsets of the unit circle in the complex plane). While all these operators with measure zero spectrum (with respect to the Lebesgue measure on the complex plane) were well studied thanks to the Spectral theorem, a little were known about the operators having a spectrum containing an open subset of the complex plane, for example, the backward shift on the Hilbert space of square summable complex sequences. Operators of this type were studied closely by Cowen and Douglas in their seminal paper – Complex geometry and Operator theory – where the Cowen-Douglas class of operators were first introduced.

In the first talk, we will describe the Cowen-Douglas class of operators, their models and unitary invariants. The second talk will be devoted to homogeneous operators in the Cowen-Douglas class where we will see how a classification of homogeneous hermitian holomorphic vector bundles yields a classification of homogeneous operators in the Cowen-Douglas class.

Department of Mathematics, Ben-Gurion University in the Negev
*Email address*: prahllad.deb@gmail.com