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*A condensed proof of the Grothendieck-Riemann-Roch theorem in differential K-theory*

Abstract: The Atiyah-Singer family index theorem can be stated as the equality of analytic and topological index maps in K-theory. In recent years, extensions of K-theory, called differential K-theory, have been developed, with motivation from mathematical physics. There are several models of differential K-theory, due to Bunke-Schick, Freed-Lott, Hopkins-Singer and Simon-Sullivan. The family index theorem and the Grothendieck-Riemann-Roch theorem has been generalized to differential K-theory by Freed-Lott and Bunke-Schick respectively. In this talk we present a condensed proof of the Grothendieck-Riemann-Roch theorem in differential K-theory. We introduce the necessary ingredients needed to understand the Grothendieck-Riemann-Roch theorem in differential K-theory, including Cheeger-Simons differential characters, Freed-Lott differential K-theory and the construction of the differential analytic index. If time permits we will go over Freed-Lott's proof of the index theorem in differential K-theory.