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FAKULTÄT FÜR MATHEMATIK

Univ.-Prof. Dr. Radu Ioan Bot, Dekan

Einladung zur öffentlichen Defensio von Herrn

Christopher Heng Chiu

Thema der Dissertation:

Local geometry of the space of arcs

Abstract: The aim of this dissertation project is to study the local geometry of the arc space of an algebraic variety X. Roughly speaking, the arc space parametrizes germs of formal curves on X. The main technical difficulty is the fact that, if X is positive-dimensional, then its arc space is a non-Noetherian scheme of infinite Krull dimension. We will first introduce algebraic tools to study the formal neighborhood of nondegenerate rational arcs as suggested by the Drinfeld-Kazhdan-Grinberg theorem. One of the key results will be de Fernex-Docampo's formula for the sheaf of differentials, which we relate to Ribenboims notion of higher derivations of modules. We will then present a generalization of the embedding codimension (or regularity defect) for general local rings to prove a finiteness statement for nondegenerate arcs. As applications, we obtain a formal embedding of the Drinfeld model in a finite-dimensional jet space as well as several results concerning Mather-Jacobi discrepancies.

Prüfungssenat:

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