

ABSTRACT

This PhD thesis is devoted to the study of \mathcal{D} -modules on rigid analytic varieties, with emphasis on the case when the ground field is discretely valued and of equal characteristic zero. Our main result establishes finiteness of the de Rham cohomology for holonomic \mathcal{D}_X -modules in the case when X is a smooth, quasi-compact, quasi-projective rigid analytic variety over the field $k((t))$ ($\text{char } k = 0$). On the way we prove some smaller results about rings of differential operators and nonarchimedean Banach algebras. We believe that those results may be of independent interest. In the last chapter we present an approach to the study of differential operators on smooth algebraic curves via the valuation theory.