113. *Normalized Series of Prestratified Spaces*

Complex Analytic De Rham Cohomology. IV

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In this note we introduce,[1] for analytic varieties, a type of series of prestratified spaces, which we call a *normalized series of prestratified spaces* (or simply a *normalized series*, when there is no fear of confusions). We also state an existence theorem on such a series. We stated two basic quantitative properties of analytic varieties in $[4]_2$. It is this notion of normalized series that constitutes basis of the discussions for the results in $[4]_2$.

Basic ideas. Let V be an algebraic or analytic variety.[2] The basic theorems: Weierstrass's preparation theorem and Noether's normalization theorem represent the variety V as a (finite) *ramified covering* of an another variety V', which has simpler properties than V. In both theorems the study of *the ramification locus* W of the covering map $\pi: V \rightarrow V'$ has important meanings for the study of the variety V. Of course, $\dim W < \dim V$, and we may say that the above theorems enable us *inductive discussions* of varieties on the dimension of varieties in question. We note, moreover, that the above theorems attach to the given variety V a set of functions, which is basic in the study of the variety V.

Now our hope in introducing the notion of normalized series is to systematize ideas[3] in the above theorems (and methods of ramified maps in general): Let V be an analytic variety. Then a *normalized series attached to* V consists of series $\mathfrak{R}$ of varieties, prestratified spaces, $\cdots$ and $\mathfrak{F}$ of collections of analytic functions (cf. n. 2). Varieties and strata appearing in the series $\mathfrak{R}$ are basically related to each other by ramified maps (arising naturally from the series $\mathfrak{R}$).

By attaching to the given variety V a *series* of varieties, prestratifications, $\cdots$ instead of a single variety (as in standard treatments of basic theorems mentioned above), we can discuss, systematically, the variety V inductively on the dimension of varieties, $\cdots$ (appearing

1) We use the same notions and notations as in $[4]_1$, $[4]_2$ and $[4]_3$. In particular we use the notion of prestratified spaces in the sense in $[4]_3$.

2) Except the part explaining basic ideas in the introduction, analytic varieties and analytic functions are always *real* analytic ones.

3) Ideas understood as explained just before.