Higher Order Tangents to Analytic Varieties along Curves. II

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Abstract. Let $V$ be an analytic variety in some open set in $\mathbb{C}^n$. For a real analytic curve $\gamma$ with $\gamma(0) = 0$ and $d \geq 1$, define $V_t = t^{-d}(V - \gamma(t))$. It was shown in a previous paper that the currents of integration over $V_t$ converge to a limit current whose support $T_{\gamma,d}V$ is an algebraic variety as $t$ tends to zero. Here, it is shown that the canonical defining function of the limit current is the suitably normalized limit of the canonical defining functions of the $V_t$. As a corollary, it is shown that $T_{\gamma,d}V$ is either inhomogeneous or coincides with $T_{\gamma,\delta}V$ for all $\delta$ in some neighborhood of $d$. As another application it is shown that for surfaces only a finite number of curves lead to limit varieties that are interesting for the investigation of Phragmén-Lindelöf conditions. Corresponding results for limit varieties $T_{\sigma,\delta}W$ of algebraic varieties $W$ along real analytic curves tending to infinity are derived by a reduction to the local case.

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