AN EXTENSION OF SLODKOWSKI'S HOLOMORPHIC EXTENSION THEOREM

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ABSTRACT

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Assume n points move holomorphically in a hyperbolic Riemann surface Y parameterized by a time parameter t that varies in a Riemann suface X with base point x_0. Let $E_t = \{p_1(t), \ldots, p_n(t)\} \subset Y$ be the positions of the n points at any time t in a pointed Riemann surface (X, x_0) and assume each point $p_j(t)$ moves holomorphically and no two points of E_t occupy the same position at the same time.

Given a new point p in Y and not in E_0 describe a recipe for a motion $p(t)$ that starts at $p = p(x_0)$, depends holomorphically on $t \in X$ and so that set $\{E_t \cup \{p(t)\}\}$ always consists of $n + 1$ distinct points.

Theorem 1. *Suppose E_t is moving holomorphically and no two points $p_j(t)$ and $p_k(t)$ of E_t occupy the same position at any moment of time $t \in X$. Then if there is a continuous motion of Y that restricts to the given motion of E_t, there is also a holomorphic motion of $\{E_t \cup \{p(t)\}\}$ that begins at the same point points $E_0 \cup \{p(y_0)\}$ and for which $\{E_t \cup \{p(t)\}\}$ always consists of $n + 1$ points.*

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