ADDENDUM TO “ON PARTITIONS OF PLANE SETS INTO SIMPLE CLOSED CURVES. II”

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In a letter, A. Beck has informed me that the methods in this paper settle a question raised informally by R. H. Bing some years ago (and answered, but not published, by Beck). Bing conjectured that if $F \subseteq E^2$ is closed nonempty and does not separate $E^2$ then $E^2 \setminus F$ can be partitioned into scc’s iff $E^2 \setminus F$ is an annulus (i.e. homeomorphic to $E^2 \setminus \{\text{point}\}$). To see how this follows from our approach, first note that, by a simple connectedness argument, no component of $F$ separates $E^2$. So let $S$ be a partition of $E^2 \setminus F$ into scc’s, and let $S' \in S$. Then $F \cap B(S)$ is compact. Applying Theorem (1) to $B(S) \sim E^2$ tells us that we can regard $F \cap B(S)$ as a singleton, say $\{q\}$. Now exchange $q$ and the point $p$ at infinity, and apply the same argument to the compact set $\{p\} \cup (F \setminus B(S))$.

REFERENCES


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