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Título: Fixed Point Theorems For Plane Continua With Applications

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Sinopsis

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In this memoir the authors present proofs of basic results, including those developed so far by Harold Bell, for the plane fixed point problem: Does every map of a non-separating plane continuum have a fixed point? Some of these results had been announced much earlier by Bell but without accessible proofs. The authors define the concept of the variation of a map on a simple closed curve and relate it to the index of the map on that curve: $\text{Index} = \text{Variation} + 1$. A prime end theory is developed through hyperbolic chords in maximal round balls contained in the complement of a non-separating plane continuum X . They define the concept of an outchannel for a fixed point free map which carries the boundary of X minimally into itself and prove that such a map has a unique outchannel, and that outchannel must have variation -1 . Also Bell's Linchpin Theorem for a foliation of a simply connected domain, by closed convex subsets, is extended to arbitrary domains in the sphere.

The authors introduce the notion of an oriented map of the plane and show that the perfect oriented maps of the plane coincide with confluent (that is composition of monotone and open) perfect maps of the plane. A fixed point theorem for positively oriented, perfect maps of the plane is obtained. This generalizes results announced by Bell in 1982.

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