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Bing-Whitehead Cantor sets

Abstract. Bing-Whitehead Cantor sets were introduced by DeGryse and Osborne in dimension three and greater to produce examples of Cantor sets that were non standard (wild), but still had simply connected complement. In contrast to an earlier example of Kirkor, the construction techniques could be generalized to dimensions bigger than three. These Cantor sets in S^3 are constructed by using Bing or Whitehead links as stages in defining sequences. Ancel and Starbird, and separately Wright characterized the number of Bing links needed in such constructions so as to produce Cantor sets. However it was unknown whether varying the number of Bing and Whitehead links in the construction would produce non equivalent Cantor sets. Using a generalization of geometric index, and a careful analysis of three dimensional intersection patterns, we prove that Bing-Whitehead Cantor sets are equivalently embedded in S^3 if and only if their defining sequences differ by some finite number of Whitehead constructions. As a consequence, there are uncountably many nonequivalent such Cantor sets in S^3 . (Joint work with D. Repovš, D. G. Wright and M. Željko.)