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Classification and enumeration of single change covering designs

Single change covering designs were initially studied in 1969 as a means to optimize magnetic tape access to fill core memory. In a series of ten papers from 1993 to 2001 By Constable, McSorley, Phillips, Preece, Van Rees, Wallis, Yucas and Zhang, the spectrum of SCCDs with block size 2 and 3 was completely solved, progress was made for block sizes 4 and higher and the investigation of “circular” SCCD was begun. In 2018 A. Chafee developed the first recursive construction for circular SCCD which prompted the search and enumeration of small ingredient designs. We describe a canonical augmentation search to enumerate SCCD and generalize Phillips’ “end-permutation” and “minor variant” classification schemes. We report our findings so far.