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*Cycle Extensions in BIBD Block-Intersection Graphs*

A cycle  $C$  in a graph  $G$  is said to be extendible if there exists a cycle  $C'$  such that  $V(C) \subseteq V(C')$  and  $|V(C')| = |V(C)| + 1$ .  
A graph  $G$  is said to be cycle extendible if every non-Hamiltonian cycle of  $G$  is cycle extendible.

A balanced incomplete block design  $\text{BIBD}(v, k, \lambda)$  consists of a set of blocks, each of which is a  $k$ -subset of a point set  $V$  of cardinality  $v$ , such that each pair of points occurs in precisely  $\lambda$  of the blocks of the design.

The block-intersection graph of a design  $D$  is the graph having the block set of  $D$  as its vertex set, and in which two vertices are adjacent if and only if their corresponding blocks have non-empty intersection.

We show that the block-intersection graph of a  $\text{BIBD}(v, k, 1)$  is cycle-extendable.

This is joint work with Atif Abueida.