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*n-Graceful Blocks*

An  $n$ -block is called graceful if:

- It consists of  $n$  pairs of distinct integers  $(x_i, y_i)$  taken from the set  $\{1, 2, \dots, 2n\}$  that are pairwise disjoint.
- $\{x_i - y_i, y_i - x_i\} \bmod (2n + 1) = \{1, 2, \dots, 2n\}$  for  $i = 1, 2, \dots, n$ ;

Problem: Can the  $2n$  choose 2 pairs from  $\{1, 2, \dots, 2n\}$  be partitioned into  $2n - 1$  graceful  $n$ -blocks?

Computational results and attempts towards a non-computational proof will be discussed. This problem arose while studying decomposition of complete graphs into cubic graphs using cubic labels with Moshe Rosenfeld. Applications include scheduling perfectly optimal round robin tournaments.