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Non-extendible latin cubes

A famous theorem of Hall says that every Latin rectangle can be extended to a Latin square. It has been known for some time that the analogous statement fails for all dimensions greater than 2. For example, not all Latin cuboids can be extended to a Latin cube. We (Bryant/Cavenagh/Maenhaut/Pula/W) construct \((2k+1) \times (2k+1) \times k\) Latin cuboids that cannot even be extended to a \((2k+1) \times (2k+1) \times (k+1)\) Latin cuboid. This demonstrates that obstacles to extension can be encountered in "thinner" examples than previously thought possible.