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Amin Bahmanian* (mbahman@ilstu.edu), Illinois State University, Campus Box 4520, Normal, IL 61790-4520. *Embedding Partial Latin Cubes*. Preliminary report.

A *latin square* of order n is an $n \times n$ array filled with n different symbols, each occurring exactly once in each row and exactly once in each column. There is celebrated result due to Ryser (1951) that a partial latin square A of order n in which cell (i, j) is filled if and only if $i \leq r$ and $j \leq s$ can be completed if and only if $N(i) \geq r + s - n$ for $i \in [n]$, where $N(i)$ denotes the number of elements of A that are equal to i . A *latin cube* of order n is a 3-dimensional array of n^3 cells so that each layer contains exactly one of $1, 2, \dots, n^2$ (A layer is obtained by fixing one coordinate). In this talk, we provide a 3-dimensional analogue of Ryser's theorem, and we also obtain partial results for higher dimensions. Our results are closely related to completing partial factorizations of multipartite hypergraphs. (Received July 29, 2018)