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Bryan A Curtis*, bcurtis6@uwyo.edu. *Extremal Matrices with the Strong Inner Product Property*. Preliminary report.

The strong inner product property is useful for constructing sign patterns that allow orthogonality. An $n \times n$ matrix with the strong inner product property has at most $n(n - 1)/2$ zero entries. In this talk we discuss how to construct matrices with the strong inner product property and $n(n - 1)/2$ zero entries, and applications of such matrices. The construction techniques that are presented have interesting ties to tournaments and weighing matrices. (Received September 11, 2020)