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Constructions of optimal orthogonal arrays with repeated rows

We construct orthogonal arrays $OA_\lambda(k, n)$ (of strength two) having a row that is repeated m times, where the ratio m/λ is as large as possible; these OAs are termed optimal. We provide constructions of optimal OAs for any $k \geq n + 1$, albeit with large λ . We also study basic OAs; these are optimal OAs in which $\gcd(m, \lambda) = 1$. We construct a basic OA with $n = 2$ and $k = 4t + 1$, provided that a Hadamard matrix of order $8t + 4$ exists.

This is joint work with Charlie Colbourn and Shannon Veitch.