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**Ken W Smith\*** ([kenwsmith@shsu.edu](mailto:kenwsmith@shsu.edu)), 335 Park Hill St., Huntsville, TX 77340. *Construction of circulant weighing matrices.*

An  $n \times n$  circulant matrix  $A$ , with entries from  $\{-1, 0, 1\}$  is a circulant weighing matrix of weight  $k$  (a  $CW(n, k)$ ) if  $AA^T = kI$ . Viewing such a matrix as an element of a group ring over the cyclic group, we use rational idempotents to construct a  $CW(48, 36)$ . (It had been previously believed that a  $CW(48, 36)$  did not exist.)

We examine other parameters and discuss the construction technique in some depth.

This is joint work with Bernhard Schmidt. (Received September 12, 2010)