

1154-VS-2017      **Niraek Jain-Sharma\*** (niraekjs@berkeley.edu), **Tanmay Khale** (tnkhale@gmail.com) and **August Liu** (ml868@cam.ac.uk). *Explicit Burgess Bounds for Composite Moduli.*

Let  $\chi$  be any Dirichlet character with modulus  $q$ . Sums of the form  $S(M, N) := \sum_{n=M+1}^{M+N} \chi(n)$ , known as *character sums*, arise naturally in many number-theoretic contexts, such as in the study of quadratic non-residues, primitive roots, and Dirichlet  $L$ -functions. Bounds on character sums can be directly translated to useful bounds in each of these situations. In his 1962 paper “On Character Sums and Primitive Roots”, D.A. Burgess proved an *epsilon bound* on short character sums for any character  $\chi$  with a prime modulus  $p$ ; shortly thereafter, in two other papers, Burgess extended this result to composite moduli as well. However, the composite moduli bounds were never made explicit. In this paper, we extend Burgess’ result and provide *explicit* bounds for any modulus  $q > 2$ . (Received September 17, 2019)