

Supercharacters and their Superpowers: The Graphic Nature of Exponential Sums

Stephan Garcia, Pomona College

ABSTRACT (TeX): The theory of $\text{\emph{supercharacters}}$ was recently developed by P. Diaconis and I.M. Isaacs (based upon earlier work of C. Andr e) to study previously intractable problems in combinatorial representation theory. When this machinery is applied to $\text{\emph{abelian}}$ groups, a wide variety of applications emerge. We develop a “super” version of the discrete Fourier transform and some combinatorial tools. This perspective illuminates several classes of exponential sums that are of interest in number theory while also producing complex-valued functions that display striking patterns of great complexity and subtlety.