1052-11-149   **Leo Goldmakher*** (`lgoldmak@math.toronto.edu`), Department of Mathematics, University of Toronto, 40 St. George Street, Toronto, ON M5S 2E4, Canada. *Multiplicative mimicry and improvements of the Pólya-Vinogradov inequality.*

Ever since its discovery in 1918, the Pólya-Vinogradov inequality has stood as the strongest bound on long character sums. In 1977, inspired by work of Daboussi and Delange, Montgomery and Vaughan obtained non-trivial bounds on exponential sums with multiplicative coefficients; this allowed them, on the assumption of the Generalized Riemann Hypothesis, to improve the Pólya-Vinogradov theorem to a best-possible estimate. In a somewhat surprising recent development, Granville and Soundararajan improved both the Pólya-Vinogradov and the Montgomery-Vaughan inequalities (unconditionally and on the assumption of the GRH, respectively) for cubic characters. We will sketch how some refinements of their ideas, combined with work of Halász, Tenenbaum, Montgomery, and Vaughan, lead to new bounds on exponential sums with multiplicative coefficients. As a consequence, we obtain improvements of both the unconditional and GRH bounds of Granville-Soundararajan for cubic character sums. Our conditional bound is best possible. (Received August 25, 2009)