

1089-35-275

Ze Cheng* (ze.cheng@colorado.edu), 1350 20th Street, Apt. K-35, Boulder, CO 80302, and
Congming Li. *Discrete Maximum Principle on The Hardy-Littlewood-Sobolev Inequality.*

In this talk, we study discrete Hardy-Littlewood-Sobolev (HLS) Inequality in a "critical" case, where the original inequality fails. For this critical case, we derive a finite form of HLS inequality with logarithm correction. Then we obtain a sharp estimate for the best constant by treating it as an optimization problem. By studying the corresponding Euler-Lagrange equation, we prove the uniqueness of nontrivial non-negative critical point, and therefore, the optimizer is unique. As a consequence, symmetry property of the optimizer is obtained. Furthermore, a discrete version of maximum principle is introduced, and as an application, we prove certain monotonicity of the optimizer. (Received February 18, 2013)