The Abelian sandpile is a so-called "self-organized critical" model on graphs. Grains of sand are randomly added at sites, which topple when they have sufficiently many grains; these topplings cause large avalanches on scales up to the system size and induce long-range correlations in the sand heights.

Letting \( N(x, y) \) denote the number of topplings occurring at site \( y \) after adding to site \( x \), it is known that \( E[N(0, x)] \sim \|x\|^{2-d} \) on \( \mathbb{Z}^d \); many other such power laws are conjectured. We show new bounds for several exponents characterizing the size of the avalanche, including the exponent \( \eta \) defined by \( P(N(0, x) > 0) \sim \|x\|^{2-d-\eta} \). Joint work with S. Bhupatiraju and A. Jarai. (Received January 20, 2015)