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Anna Fey-den Boer* (annefey@chello.nl), Eindhoven, Netherlands, and **Haiyan Liu,**
Ronald Meester, Corrie Quant and **Frank Redig.** *Quasi-units in Zhang's sandpile model.*

Zhang's model is a non-abelian sandpile model. In contrast to the widely studied abelian sandpile model, additions consist not of one grain, but of a random, continuous amount of sand, uniformly distributed on an interval $[a, b] \subseteq [0, 1]$. Sites with height at least 1 are unstable; in a toppling, the entire height of a site is distributed evenly among the neighbors.

Numerical simulations of this model on large grids have indicated that the stationary height distribution per site is sharply peaked at discrete values, resembling that of the abelian sandpile model. Zhang called these values 'quasi-units'. We have defined and analyzed this model rigorously in dimension 1. Our main result concerns the limit of infinite grid size, with $a \geq 1/2$. We find that the stationary height distribution indeed tends to that of the abelian sandpile model, up to a scaling factor. Among other results, we prove uniqueness of the stationary height distribution for all $0 \leq a < b \leq 1$.

Finally, I will outline some future research plans on this model: study phases transitions in an infinite volume version, investigate the quasi-unit value as a function of a and b , study the model in higher dimensions, and eventually form a link with neuronal network modeling. (Received February 11, 2008)