1016-05-172 **Igor Gorodezky*** (igor2006@uchicago.edu). *On the transience class of the Abelian Sandpile Model.* Preliminary report.

The Abelian Sandpile Model (Bak et al. 1988) takes a finite graph G with a *sink* vertex s such that G and $G - s$ are connected. A *configuration* is an assignment of a number of 'grains of sand' to each 'site' (non-sink vertex). A site with at least as many grains as its degree is 'unstable' and passes one grain to each neighbor ('toppling'); a *stable* configuration has no unstable sites. Grains received by the sink disappear. An unstable configuration stabilizes in a finite number of topplings to a unique stable configuration (Björner et al. 1991).

Fix G and consider the process of adding one grain at a time and stabilizing. A stable configuration is *recurrent* if it can be reached repeatedly in this process. We define the *transience class* of G as the maximum number of grains that can be added before the configuration necessarily becomes recurrent.

We study the asymptotic growth of the transience class as a function of the size of G. We exhibit a family of graphs with exponential transience class. We prove that for the rooted square grids, a family of Abelian Sandpile Models of particular interest to statistical physics (Dhar et al. 1995), the transience class is polynomially bounded.

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