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**J K Herring\*** (jkh011@shsu.edu), **E Meza** and **C M Nieuwoudt**. *The Abelian Sandpile Model*.

In 1987 physicists Bak, Tang, and Westfield introduced the sandpile model to study the dynamics of sandpile avalanches. The sandpile model is represented by a combinatorial graph  $G$ . Surprisingly, this model has the structure of a finite abelian group which arises as the cokernel of the Laplacian of the graph  $G$ . One of the main problems consists in finding the group associated to a given graph, which is done by computing the Smith Normal Form of the Laplacian. It is a more challenging combinatorial problem to find the structure of the family of groups arising from a given family of graphs. Only a few results are known in this direction. Families of graphs whose sandpile groups have been characterized include cycle graphs, wheel graphs, complete graphs, and complete multipartite graphs. In this talk we will describe the sandpile group of a family of graphs known as book graphs. We will also make connections between the elements in the group and the sandpile configurations in the model. Our proofs are based on a careful study of the Laplacian of these graphs and rely on Linear algebra techniques. (Received September 23, 2011)