1077-05-694 **Noah Streib*** (nstreib3@math.gatech.edu). *Hamiltonian Cycles and Symmetric Chain Partitions of Boolean Lattices.*

Let $B(n)$ be the subset lattice of $\{1, 2, \ldots, n\}$. Perhaps the most famous result concerning $B(n)$ is Sperner's Theorem, which states that the width of $B(n)$ is equal to the size of its biggest level. There have been several elegant proofs of this result, including an approach that shows that $B(n)$ has a partition into w symmetric chains (chains that are "vertically centered"), where w is the width of $B(n)$. A second famous result concerning $B(n)$, taking only a simple induction to prove, is the fact that the cover graph of $B(n)$ is Hamiltonian.

Motivated by the Middle Two Levels Conjecture, which states that the bipartite graph induced by the two largest levels of $B(2n + 1)$ is Hamiltonian, we combine the ideas of the preceding paragraph. To this end, we consider posets that have the Hamiltonian Cycle–Symmetric Chain Partition (HC-SCP) property. A poset of width w has this property if its cover graph has a Hamiltonian cycle which parses into w symmetric chains. We show that the subset lattices have the HC-SCP property. Furthermore, using a technique similar to the above-mentioned proof of Sperner's Theorem, we obtain this result as a special case of a more general treatment. (Received September 10, 2011)