1056-05-1254 **Maria Axenovich*** (axenovic@iastate.edu), 412 Carver Hall, Ames, IA 50011, and **Jacob Manske** and **Ryan Martin**. *On extremal problems in a Boolean lattice.* Preliminary report.

Let P be a fixed subposet of a Boolean lattice. Let the maximal number of elements in a Boolean lattice Q_n that induce a subposet containing no copy of P be $ex(n, P)$. Denote the size of a middle layer of Q_n by N.

The classical Sperner theorem states that $ex(n, P_2) = N$, where P_2 is a two element chain. There are several other examples of posets for which the extremal function has been calculated asymptotically. In all of these known cases $ex(n, P) = iN(1 + o(1))$, where i is an integer. It has been conjectured that the extremal function is always an integer multiple of the middle layer size.

The only poset with at most 4 elements for which this conjecture is not confirmed is Q_2. We provide improved bounds on $ex(n, Q_2)$ and show the limitation of classical methods applied to this problem. (Received September 21, 2009)