

1052-13-168

**Susan E. Morey\*** ([morey@txstate.edu](mailto:morey@txstate.edu)), Department of Mathematics, Texas State University, 601 University Dr., San Marcos, TX 78666. *Depth Bounds and Cohen-Macaulayness for Square-free Monomial Ideals.*

There is a natural one-to-one correspondence between square-free monomial ideals and simple hypergraphs, also called clutters. Using this correspondence, combinatorial properties of the hypergraph associated to an ideal can be used to determine algebraic properties of the ideal. In this talk, a lower bound will be given for  $\text{depth}(R/I^t)$  for  $t \geq 1$  when  $I$  is the edge ideal of a tree. A similar bound will be given for small powers  $t$  when  $I$  is the edge ideal of a graph. For more general square-free monomial ideals, conditions will be given under which  $\text{depth}(R/I^t)$  is positive. A combinatorial condition on a hypergraph, which extends results of Herzog and Hibi for edge ideals of bipartite graphs, will be given under which  $\text{depth}(R/I)$  is maximal, or  $R/I$  is Cohen-Macaulay. (Received August 26, 2009)