1092-13-226 **Susan M. Cooper*** (s.cooper@cmich.edu), Department of Mathematics, Central Michigan University, Mt. Pleasant, MI 48859, **Robert Embree** (robertembree@gmail.com), Department of Mathematics and Statistics, Queen's University, Kingston, ON K7L 3N6, Canada, **Huy Tài Hà** (tai@math.tulane.edu), Department of Mathematics, Tulane University, New Orleans, LA 70118, **Andrew H. Hoefel** (ahhoefel@mast.queensu.ca), Department of Mathematics and Statistics, Queen's University, Kingston, ON K7L 3N6, Canada, and **Gregory G. Smith** (ggsmith@mast.queensu.ca), Department of Mathematics and Statistics, Queen's University, Kingston, ON K7L 3N6, Canada. *Containment Problems for Monomial Ideals.*

Much work has gone into investigating the differences between symbolic and regular powers of homogeneous ideals. Motivated by work of Harbourne and Huneke, we explore for which m, i and j we have the symbolic power $I^{(m)}$ contained in $M^j I^i$ where $I \subset k[x_1, \ldots, x_n]$ is a monomial ideal and $M = (x_1, \ldots, x_n)$. For square-free monomial ideals we obtain a certain containment which recovers two conjectures; one of Harbourne–Huneke and one of Bocci–Cooper–Harbourne. We also introduce the symbolic polyhedron of a monomial ideal and use this to explore symbolic powers of non-square-free monomial ideals. (Received August 10, 2013)