1113-05-157 **Federico Ardila**, **Federico Castillo** and **Jose Alejandro Samper***
(samper@math.washington.edu). *The topology of the external activity complex of a matroid.*

Given an ordered matroid M, Ardila and Boocher defined the so-called external activity complex of M. Their motivation came from studying varieties that result from embedding a linear space into a product of projective lines. Ardila and Boocher showed that this simplicial complex is Cohen-Macaulay and asked if it is, in fact, shellable. We study the combinatorics of the external activity complex of M and prove that it admits a lot of interesting shelling orders that are deeply related to both the lexicographic shelling of M and the lexicographic shelling of its dual matroid M*. In particular, the external activity complex has the same h-vector as the independence complex, contains a naturally embedded copy of the independence complex, and it is almost always (except in a few trivial cases) contractible when all its cone points are removed. This means that the external activity complex provides a topologically simpler model for several combinatorial invariants of the matroid, and as a result, opens the door for studying such invariants from different algebraic and topological perspectives. (Received August 19, 2015)