1141-06-19 **Jinha Kim**, , South Korea, **Ryan R Martin*** (rymartin@iastate.edu), 396 Carver Hall, 411 Morrill Road, Ames, IA 50011-2104, **Tomas Masarik**, , Czech Rep, and **Warren Shull**, **Heather C. Smith**, **Andrew Uzzell** and **Zhiyu Wang**. *On difference graphs and the local dimension of posets.*

The dimension of a partially-ordered set (poset) is the minimum number of linear extensions sufficient to ensure that for every incomparable x and y, there is one of the extensions that yields $x < y$. Introduced by Dushnik and Miller, the dimension is a well-studied parameter. However, in any given realization of the dimension of a poset, a given element might not be in many linear extensions.

Ueckerdt introduced the invariant called local dimension which, instead, uses partial linear extensions and which is bounded above by the Dushnik-Miller dimension. For instance, the dimension of the standard example of order n is $n/2$, but the local dimension is only 3.

In this talk, we study the local dimension of show that the maximum local dimension of a poset of order n is $\Theta(n/\log n)$, the local dimension of the n-dimensional Boolean lattice is at least $\Theta(n/\log n)$ and make progress toward resolving a version of the removable pair conjecture for local dimension. We also connect the computation of local dimension of a poset to the decomposition of the edges of a graph into what are called difference graphs. (Received June 14, 2018)