1145-VV-1868 **Molly Lynch*** (melynch4@ncsu.edu). *Relations in doubly laced crystal graphs via discrete Morse theory.*

Many crystal graphs have a natural partial order associated to them. Much of the structure of these graphs has been revealed by local relations given by Stembridge and Sternberg. However, there exist relations among crystal operators not implied by these local relations. We use a tool from topological combinatorics known as lexicographic discrete Morse functions to relate the Möbius function of a given interval in a crystal poset to the type of relations that can occur among crystal operators within this interval. More specifically, for a crystal of a highest weight representation of finite classical Cartan type, we show that whenever there exists an interval whose Möbius function is not equal to -1, 0, or 1, there must be a relation among crystal operators within this interval not implied by Stembridge or Sternberg relations. (Received September 24, 2018)