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Kimberly D'souza* (ksevin2@lsu.edu) and **Guoli Ding** (ding@math.lsu.edu). *A Decomposition Theorem for Weakly 4-Connected Graphs*. Preliminary report.

A graph G is called H -free if G does not contain a graph isomorphic to H as a minor. In this talk, we consider finding H -free graphs, where H is a weakly 4-connected graph. If we have a 3-connected graph G , we discuss a decomposition theorem for splitting G into weakly 4-connected components. We prove that G is H -free if and only if each of the weakly 4-connected components is H -free. We are able to apply this decomposition to the problem of finding all H -free graphs for a chosen weakly 4-connected graph H . First, we generate all of the weakly 4-connected H -free graphs. Then, we are able to reverse the decomposition to generate all 3-connected H -free graphs. Finally, we use a well known theorem to describe the entire set of H -free graphs. In this talk, we will first discuss the decomposition theorem. Then, we will show the application of the theorem to the Pyramid, a weakly 4-connected graph. (Received August 05, 2015)